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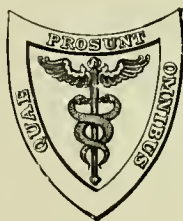


TUBERCULOSIS AND THE COMMUNITY

BY

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PREFACE.

A FEW years ago Dr. Roger I. Lee, Professor of Hygiene at Harvard University, asked me to give him reference to some book that he might recommend to his students, which took up the hygiene of the community sick with tuberculosis rather than the individual. I could find no such book. There were many excellent works dealing with tuberculosis from the medical point of view and from the layman's point of view, but I could find none that dealt purely with tuberculosis as it affected the community as a whole. Hence this volume.

In the preparation of this monograph, originality has seemed to me of less importance than a simple presentation of scientific facts. Hence, I have put between one pair of covers the information to date found in innumerable reports, transactions, special articles, etc. which in my official relations it has been my duty and pleasure to collect. In using this mass of material my effort has been to bring out the more important points and to omit unnecessary detail, particularly statistics. Naturally enough the whole has been tinged with my own opinion, such as it is.

For much of the information found in the chapter on Tuberculosis and Nursing, I am indebted to Miss Bernice W. Billings, than whom I know of no greater authority in this field of work. Many of the details she has given me are not to be found elsewhere in print and I am sure will prove of very real help to nurses and others.

Tuberculosis is now not only a medical but a social problem of enormous importance. To the vast army fighting tuberculosis I hope this book will be of much practical value, and a source of important information to general readers as well.

JOHN B. HAWES, 2d.

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TUBERCULOSIS AND THE COMMUNITY.

CHAPTER I.

HISTORICAL.

The history of tuberculosis is the history of civilization. It is a curious and somewhat unpleasant commentary upon our methods of living, that wherever the foot of civilized man has trod, tuberculosis in some form or other has borne him company. We are liable to look upon infantile paralysis, trench nephritis, epidemic cerebrospinal meningitis, and others, as comparatively new diseases; tuberculosis—consumption—phthisis—call it what you will, has been with us always.

Unmistakable traces of tuberculosis have been found in the dried remains of Egyptian mummies, Babylonian tablets make mention of it, and reference to it is made in many old Greek manuscripts. True, it was not then called tuberculosis, as this name is of comparatively recent date, but the description of the disease is too vivid to allow of error. Hippocrates (B.C. 460–376) described tuberculosis as “a disease most difficult to treat and one that proves fatal to the greatest number,” and taught “that consumption came from the consumptive;” another writer refers to it in an essay, “On those who are attacked with a cough after illness.” Some advised sea voyages, and others a mountain climate

in the way of treatment. Occasional reference is found as to its contagiousness and transmissibility, but practically no mention is made as to the possibility of its cure, it being generally looked upon as a manifestation of the displeasure or anger of the gods. Even before 500 A.D., Galen, Celsus, and others referred to tuberculosis in their writings. Galen, in particular, emphasized its contagiousness and called attention to the danger of those living in close proximity to a consumptive, while Celsus recommended a milk diet, outdoor living and a change of climate, particularly that of Egypt. His advice is as good now as it was the day he gave it, centuries ago, although we now know that his idea and that of others of his time, that tuberculosis was hereditary, was quite wrong.

During the dark ages, scientific and medical study and investigation fell into a decline. Only in Arabia was the lamp of science kept burning and that at best but dimly. With the Renaissance, however, the study of medicine was taken up anew, and special books on tuberculosis began to appear. The danger to those living in intimate contact with a consumptive was by this time clearly known; how this danger existed or when the transmission of the disease took place, however, was still a mystery. One writer went so far as to advise the use of sputum cups and that the walls of a consumptive's bed chamber be white-washed. Surely these were up-to-date measures that modern boards of health might well study and profit by. The most important contribution to the literature on tuberculosis of this period was that of Richard Morton, an English physician, who in 1689 published his "*Phthisologia*." He recognized its prevalence and even doubted if anyone could die without "a touch of consumption." This is in marked accord with our modern view that by the time the fourteenth year is reached every

one is more or less infected with tuberculosis. Morton was among the first to speak of the possibility of a cure of consumption, but he likewise warned against undue optimism by referring to its marked tendency to relapse. In 1810, Bayle coined the word "tuberculosis" and gave it to this disease. Although Sylvius in 1650 had described "tubercles of the lung" very accurately, it was Bayle who connected these with the disease itself and named it after them. In examining the lungs of those who had died of tuberculosis, he noticed the innumerable minute lumps or nodules that are so strikingly characteristic of this condition, and as "tuberculum" is the Latin for such a little nodule, he called the disease "Tuberculosis."

The modern history of tuberculosis begins nine years after this, when in 1819, four years after the battle of Waterloo, Laennec published his classic work, "*de l'Auscultation Médiale.*" Laennec himself later died of consumption, the very disease he had done so much to combat, but his work still stands as one of the best descriptions of tuberculosis, anatomically, pathologically and in many ways clinically. It was largely through the investigation of Bayle and Laennec that it came to be recognized that the different manifestations in which tuberculosis showed itself must be due to the same cause. Up to this time, and indeed for many years afterward, no one had been able to prove definitely that consumption could be transmitted from one person to another, although many had thought so. An interesting side-light on this is shown in a letter written by Chateaubriand in 1803 from Rome to a friend concerning the death from consumption of Madam de Beaumont: "I am in a great difficulty. I had hoped to get 2000 crowns for my carriages, but phthisis is declared in Rome a contagious disease, and as Madame de Beaumont drove two or three times

in my carriages, nobody is willing to buy them." In 1865, at about the end of the Civil War, a French army surgeon, named Villemin, demonstrated conclusively that tuberculosis could be transmitted from man to animals, and that it must be classified among what we call the "specific infectious diseases." This term simply means that tuberculosis, like smallpox, plague, or typhoid fever, is a disease caused by a definite microörganism or germ which, under certain conditions, can be transmitted from one person to another. This was a distinct step forward despite the fact that no one had as yet discovered the germ itself. Numerous investigators were at the threshold of making this discovery; the germs of anthrax, typhoid and other diseases had been seen, isolated and described, but it was not until 1882 that Robert Koch of Berlin made his epoch-making discovery of the tubercle bacillus. This date marks the beginning of a rational and intelligent campaign against consumption.

One should not conclude from the fact that the tubercle bacillus was discovered in 1882 that there was no treatment of consumption before this. As referred to previously, even in the oldest times, treatment was advised much along modern lines, but such treatment was rather a desultory attempt to prolong the patient's life and to make him comfortable rather than anything else. Early in the nineteenth century a French physician, more hopeful than others of his period, wrote: "There are two kinds of consumption: that of the rich which is sometimes cured, and that of the poor which is never cured," but even as late as 1874 another physician, evidently a profound pessimist, remarked that there were only two remedies for consumption, "morphine and lying," showing that in his opinion at least all one could do for a consumptive was to give him enough morphine to make him physically comfortable and to try to make him

mentally so by telling him he was sure to get well. The modern or so-called "sanatorium treatment" of tuberculosis dates back to 1840. By sanatorium treatment is meant an aggressive attempt to cure consumption or to at least arrest the progress of the disease by regulating the patient's life in every way, so that he receives the maximum of fresh air, rest, good food, etc., thus to enable his own vital forces to conquer the disease germs. This is best done when the patient is under close observation in a sanatorium, hence the term "sanatorium treatment." In 1840, Dr. Bodington of England, "an obscure country practitioner of Warwickshire," published an essay on "The Cure of Pulmonary Consumption on Principles Natural, Rational and Successful," based on the case of a young girl whose faith in him prevailed against the strenuous opposition of her people and who on his advice passed her days, even in winter, out of doors riding on a donkey. Although at first her cough was worse, she persevered, recovered and lived to a ripe old age. Dr. Bodington built an institution in which to carry out his own ideas, but was unable to stand the storm of ridicule and abuse heaped on him by the medical profession, and therefore transformed his sanatorium into an insane asylum wherein he himself later died. So this brave attempt to introduce rational treatment met with utter failure. In Germany, however, Brehmer of Goebersdorf, a little village in the Black Forest, succeeded where Bodington had failed, and in 1854 opened what was the first real sanatorium for the treatment of tuberculosis. Following this the sanatorium idea spread rapidly through England and France and later to this country. Here Dr. Edward Livingston Trudeau, who died in the year 1915, had been for nearly half a century the one great figure in our winning fight against tuberculosis. In 1874, when a young man in New York, recently married,

with a brilliant career in that city before him, Dr. Trudeau was told by his physician that he had advanced phthisis and only a few months more to live.

The story of how he prolonged these few months to over forty years, as told in his own simple and yet vividly picturesque words, is one which everyone should read. Leaving New York, Dr. Trudeau went to the Adirondack Mountains, and at Saranac Lake spent the first two winters practically alone, except for the few hunters and fishermen living nearby. Impressed by the rapid improvement in his health, his physician in New York sent others similarly affected to Saranac Lake so that gradually there grew up in this little mountain village a community of men and women and often their families who there sought and found health, happiness and strength. The Adirondack Cottage Sanitarium, now fittingly called the Trudeau Sanatorium, when first established was a small and primitive affair; it is now a large institution and embodies all that is latest and best in the treatment of tuberculosis. Patients from all over the country and indeed from all over the world have here found health, hope and courage to maintain their fight against disease. As a result of the successful results here obtained, countless other institutions, public and private, have been built all over the country.

One of the earliest and best known of these is the Sharon Sanatorium in Massachusetts. This was the first institution of the kind to be built away from the mountains, and practically at sea level. It was due to the high faith of Dr. Vincent Y. Bowditch of Boston that neither mountain air nor altitude alone were essential to the cure of consumption, but that fresh air, outdoor living, and a well regulated life were the primary essentials in its successful treatment, that the Sharon Sanatorium was founded, and it was because of

the success of this institution that the State of Massachusetts in 1898 opened the first state sanatorium in this country at Rutland.

The history of tuberculosis since Massachusetts first established a state sanatorium has been one of steady progress. Facilities for the institutional care of consumptives and of tuberculosis in all its forms have tremendously increased. Sanatoria, hospitals, preventoria, dispensaries, open-air schools, day and night camps, have been established all over the country. It became evident, however, that prevention must go hand in hand with cure, and it has been toward prevention and education as well as cure that our efforts of more recent years have been directed. The antituberculosis campaign during the past ten or fifteen years therefore has been one of education of the medical and lay public not only in regard to the cure of tuberculosis, but especially in regard to its prevention. Antituberculosis societies have sprung up all over the world; in this country practically every state has an organization of this kind, all linked together by the central body, the National Tuberculosis Association.

No one can foretell what the future history of our fight against tuberculosis will be. Some believe that a drug or panacea of some kind will be discovered as has been the case in that other great enemy of mankind, syphilis. Others, doubtful as to this, are looking for some antitoxin, serum or vaccine that will conquer this enemy, while still others, nearer the truth, are of the opinion that gradually the human race will become immune to tuberculosis so that while the disease itself is still with us, the harm it does will amount to little. At all events there must be no letting up in our efforts, but continued unremitting study, investigation and education, if we ever expect to control tuberculosis.

CHAPTER II.

THE FREQUENCY OF TUBERCULOSIS.

EVERY one knows that tuberculosis is one of our most common diseases. We all know, and if we do not we should know, that tuberculosis kills more people every year in this country than were killed in all four years of our Civil War. In other words, during the four years of Civil War there were killed or died from wounds about 205,000 men, or 50,000 per year, while at present it is estimated that well over 150,000 persons die from tuberculosis every year in this country; that its toll of death is greater than that of all the infectious diseases of childhood combined; that one out of every nine persons dies of it; that someone dies of it every minute night and day; that the death rate from cancer is not nearly so great as that of consumption, and that even the terrible epidemics of infantile paralysis and influenza, against which the entire country has been up in arms, are almost mere details compared with what tuberculosis is doing slowly, quietly and unobtrusively in our midst.

At tuberculosis exhibits and lectures, at the movies, in churches and in schools, in magazine articles and in the daily press we have listened to imposing arrays of facts and figures and have examined charts and tables that have deeply impressed us. Although such facts and figures as these which might be almost endlessly multiplied are indeed striking and are of real value in order to impress the public with the seriousness of the menace of tuberculosis, they do not furnish

accurate or scientific information as to the frequency of tuberculosis. Such facts are hard to obtain. We are at once confronted by a very real difficulty, namely, that of distinguishing between tuberculous infection on the one hand and tuberculous disease on the other. The term "tuberculous infection" simply means that somewhere in the human body is a small number of germs of tuberculosis, causing, however, no symptoms. Just as practically every one of us has in the mouth at all times the germ of pneumonia, and yet most of us escape having pneumonia, so it is true beyond the shadow of a doubt that most of us by the time we reach our fifteenth year harbor in our bodies the germs of tuberculosis without our having any symptoms or signs of disease now or in the future from this source. This is *tuberculous infection*.

Tuberculous disease, on the other hand, is of course, quite another thing. When the germs of tuberculosis hitherto lying dormant or inactive in the body, for some reason or other become active and produce symptoms, such as fever, loss of weight and strength, cough, etc., then we no longer speak of *tuberculous infection*, but *tuberculous disease*. If this is confined to the lungs we call it "pulmonary tuberculosis," "consumption" or "phthisis," or if it is in some other part or organ of the body, we describe it as tuberculous peritonitis, or tuberculosis of the hip, spine, etc., according to the locality of the disease.

Thus one can plainly see the importance of distinguishing between these two conditions, tuberculous infection and disease. And yet, strange to say, these two terms are constantly being confused. Patients are sent to sanatoria or elsewhere and their homes broken up unnecessarily and on insufficient evidence. An *x-ray* examination, for instance, may show certain shadows or spots in the lungs which are undoubtedly

due to tuberculosis, but by the *x*-ray alone it is difficult or impossible to tell whether or not the tuberculous process is active or inactive, old or recent, or in any way the cause of symptoms of which the patient complains. Likewise the so-called tuberculin test is responsible for similar errors. Owing to the fact that practically every one of us after the fifteenth year has somewhere in the body a trace of tuberculosis, usually doing no harm and causing no symptoms, many of us will react positively to this very delicate test. Unless, however, there are signs and symptoms that the patient is sick and that the disease is active, a positive tuberculin test in an adult means little or nothing. Communities, and especially those most active in antituberculous measures, have not infrequently been unnecessarily alarmed because of reports based on similar insufficient evidence that tuberculosis was rife among the school children. Therefore, one cannot over-emphasize the importance of not confusing these two terms in speaking of the frequency of tuberculosis.

Let us first consider the frequency of tuberculous infection. Upon what sources of information do we base the statement that by the time the fifteenth year is reached practically all of us are harboring the germs of tuberculosis somewhere in our bodies? There are two such sources of information; (1) the examination of the bodies of those who have died from causes other than tuberculosis to see if in such bodies, in whom during life tuberculosis was not suspected, there were any traces of the disease, and (2) the results of tuberculin tests. Tuberculin, a product made from the bodies of tubercle bacilli or germs, is a liquid which, if injected underneath the skin of a normal, healthy individual, who has no trace of tuberculosis in his body would cause no symptoms whatsoever any more than would sterile water or salt solution. If, however, the individual has tuberculosis, no matter

in how small amount or how inactive, in the vast majority of instances he will "react" shortly after the tuberculin is given. Such a reaction consists of a rise in temperature and a general "grippy" feeling and often redness, pain and swelling where the tuberculin was injected. This same test is used to detect tuberculosis in cattle.

Taking the first source of information, postmortem examination, we again face difficulties in getting at the exact truth because of the scarcity of material, especially in this country, and again because of the great difference of opinion among pathologists as to what in such examinations really constitutes evidence of tuberculosis. To the casual observer it might seem an easy task to tell whether or not there was any trace of tuberculosis in a given case. It must be remembered, however, that the germs of the disease are very small and that in the early stages the changes they bring about in the human system can often only be seen by careful microscopic examination. In addition to the scarcity of material, then, and the varying standards of diagnosis, there is the additional fact that it is only at large hospitals in the great medical centers of this country and of Europe that any great number of autopsies or postmortem examinations are performed; these are largely upon the bodies of the poorer classes, especially city dwellers, a group far more exposed to tuberculosis than are the so-called upper classes and those who live in the country. While it is unfair, therefore, to draw definite conclusions from such statistics as to the prevalence of tuberculosis among the entire population, it is nevertheless true that as tuberculosis is largely a disease of the poorer classes, such figures will give some idea at least as to the prevalence of this disease among those most concerned. Bearing in mind these difficulties and sources of error, let us consider the evidence as submitted.

Nägelli in 1900 gave us the best information on this subject. The results of his findings, based on a series of 500 autopsies, showed evidence of tuberculosis in 96 per cent of the cases. Burkhardt in 1906 confirmed Nägelli's figures. He found 92 per cent of cases showing evidence of tuberculosis out of 1452 autopsies on patients dying from various causes except tuberculosis. These are the generally accepted figures and if taken at their face value mean that practically every adult at some time or other is infected with tuberculosis.

But in order to carry on our campaign with intelligence we must know more than this. We must know *when* a person is most liable to be thus infected in order to safeguard him during this dangerous period. So the question as to the prevalence of infection among children and at what age they are most liable to infection is of vital importance and one that merits careful consideration. Here we find a vast difference of opinion, as shown in the following table arranged by Arnold Klebs:

Author.	Age of children.	No. of Autopsies.	No. of tuberculous.	Percentage of tuberculous.
Müller, 1889 . . .	0 to 15 yrs.	500	209	42
Councilman, etc., 1901	?	220	35	16
Baginsky, 1902 . .	?	806	144	18
Orth, 1904	0 to 15 yrs.	435	43	10
Nägelli, 1900	0 to 15 years.	88	15	17
Burkhardt, 1906	6 wks. to 15 yrs.	190	72	40
Hamburger—Sluka, 1905	0 to 14 yrs.	401	160	40
Hamburger-Ghon, 1907	0 to 14 yrs.	848	335	40
Sehlback, 1908	0 to 14 yrs.	1423	180	13
Beitzke, 1909	0 to 15 yrs.	397	54	13.6

According to these figures some investigators such as Beitzke and Sehlback found only 13.6 per cent of their cases

from birth up to the fifteenth year to be tuberculous, while others such as Burkhardt, Sluka and Hamburger and Ghon found 40 per cent of such children to show signs of tuberculosis. Excluding children from birth up to one year of age, during which period the chance of infection is necessarily slight, the proportion of children from the fifth to the fifteenth year found to be tuberculous is 65 per cent. This is the generally accepted figure. Probably the proportion of tuberculous children from birth to the fifth year is not over 15 per cent. To summarize these figures, then, we may in plain language safely conclude:

1. That the great majority of adults (90 to 95 per cent) are infected to a certain extent and fortunately usually a very slight extent with tuberculosis. This does not prevent us from being perfectly normal individuals, or necessarily mean that we are sick in any way.

2. That from birth to the fifth year less than 15 per cent of children are infected with tuberculosis, and from the fifth to the fifteenth year, approximately 65 per cent have such a tuberculous infection, and as a necessary corollary to this that the great majority of all tuberculous infection takes place in childhood.

Let us now compare the information obtained from this source, postmortem examinations, with that obtained from tuberculin tests applied to living human beings. These tests are extremely delicate and as mentioned before, make no distinction between tuberculous infection and tuberculous disease. A positive reaction to such a test simply means that somewhere in that person's body is a focus of tuberculosis; the test, except in the case of very young children, gives no information as to whether that focus is or is not causing symptoms.

Franz found that 61 per cent to 68 per cent among several

hundred soldiers of the Austrian army reacted positively to comparatively small doses of tuberculin. Von Pirquet found that practically all adults reacted to the cutaneous tuberculin test, thereby confirming Nägelli's figure of 96 per cent of positive results in his autopsy series. Here again the figures relating to adults are less interesting than those dealing with children. Von Pirquet, 1909, reports the results of cutaneous tuberculin tests on 1407 children. The proportion of those reacting positively increases from 5 per cent in the first year up to 80 per cent in the tenth and eleventh years and to 94 per cent by the time the fifteenth year was reached. This means only *tuberculous infection*. The proportion of those showing signs of clinical tuberculous disease, except in the first two years when infection always means disease, was much lower, never going higher than 21 per cent or 22 per cent as compared with the 90 per cent of tuberculous infection or latent tuberculosis.

That tuberculosis is a true children's disease, therefore, or rather an infection of childhood, is shown by these figures which likewise confirm the statement given previously that by the time the fifteenth year is reached the majority of children are already infected with tuberculosis. Here once more it is essential to remember that this means tuberculous infection and *not* tuberculous disease.

Now at this point it is quite natural for one to feel that while these facts and figures in regard to tuberculous infection are doubtless very interesting and valuable, a much more important and vital question is concerning the number of persons who have not only a tuberculous infection, but who have tuberculous disease and are actually sick and in need of treatment and, of still greater importance, are a source of danger to others. Our answer to this question must be more or less guess work at the best. There is no way of making a

person admit or declare that he has consumption; although there are numerous laws on the subject, it is a difficult matter to persuade every physician that every case of tuberculosis should be reported to the proper authorities; to diagnose tuberculosis in its early stages is one of the most difficult tasks in medicine, so that it is no wonder that so many cases go undiagnosed until very late in the disease, and finally, there is still present in the minds of the people, to a certain extent, the result of our propaganda against it, a very definite stigma attached to anyone unfortunate enough to have consumption. For these and for other reasons it is only too evident how difficult it is to find out how many persons in any given community are suffering with tuberculous disease in some form or other.

The number of deaths reported by physicians of those who have died from tuberculosis does not help us much, although it gives us a minimum figure at least. It is far below the actual truth, however. Inasmuch as tuberculosis is a most chronic disease, so that the majority of patients are actively sick for at least two years prior to death, multiplying the number of deaths by two gives a rough estimate, but one that is probably still far below the actual figure. Philip of Edinburgh goes to the other extreme, and advises using the factor twenty, and multiplying the number of deaths by this. Klebs states that three is the usual factor used for this purpose, and succinctly adds that "the results are meaningless." From a practical standpoint, in order to find out how many beds in any given community are needed for cases of pulmonary tuberculosis, the State of Massachusetts takes the average number of deaths for the past three years and demands one bed for every two such deaths. This is too low a figure, and should be raised to one bed for every death from tuberculosis. Although such a method

of figuring gives us no real idea as to exactly what proportion of the community is suffering from tuberculosis, it does at least furnish a working plan that meets requirements as to the number of beds needed.

How, then, are we to find out the truth? Public opinion is so well educated in regard to typhoid, smallpox, scarlet fever, diphtheria, etc., that few physicians would dare not to report their cases accurately and promptly, with the result that the number of reported cases may be used as a fairly safe index of the incidence of any one of these diseases in any community. With tuberculosis it is different, so that, as I have said before, the number of cases reported does not represent the number sick with this disease. Indeed, in many smaller communities we have the absurd situation, if it were not almost a tragic one, of having the number of cases reported for a year less than the number of those who have died of tuberculosis during the same period.

The only real way to get the truth of this matter is to work and work hard for it. There is no easy short cut. More and more it is becoming the custom for communities, just as is the regular custom with factories and stores, to have an annual stock-taking in terms of health. These are called "health surveys." To find out the amount of tuberculosis, then, in any community, a survey of that community must be made. Every known or suspected case must be looked up and its present condition ascertained; there must be wholesale examinations not only of the sick, but of the families of the well, also. Doctors must be interviewed and information sought from them; schools, factories, etc., must be gone over carefully and every clue investigated. Only in this way can we find out accurately how many consumptives there are in our midst. Startling disclosures will be made, very unpleasant to local health boards and to other authorities,

but it is wholesome medicine even if it is bitter. In one large city, for instance, which had prided itself on its local hospital and its efficient and up-to-date methods of handling consumption, a recent tuberculosis survey revealed the fact that there were over 50 patients with active tuberculosis, under no supervision, who had worked until within one month of their death, and 150 who had worked until within three months of death. Another town, and one of the wealthiest in the world, said it had no cases of tuberculosis and therefore no tuberculosis problem. A survey at once revealed 18 sick patients and forced the town to build a local tuberculosis hospital at once. It is evident, therefore, that we have as yet no short and accurate method of finding out beforehand how much tuberculosis there is in a community except in a very rough way. As mentioned above, doubling the number of deaths for any year will give some indication of the number who are actively sick, while to demand one bed for every death from tuberculosis, based on the average of deaths for the past three years, will fairly well meet the needs of any community as to the number of beds.

The Community Health and Tuberculosis Demonstration now being carried on in Framingham, Massachusetts, has given us a more accurate idea as to the prevalence of active tuberculosis in such a community than we ever had before. The conclusions here reached, based on extensive medical examination of a large proportion of the population, are that for every reported death from tuberculosis there are approximately 9 or 10 active cases in the community, and that there should be a proportion of one hospital bed for every reported death. These Framingham figures are alarming and startling. Although there are certain factors connected with them which do not render them entirely applicable to the country at large, they do merit most careful consideration.

We have more exact figures as to the mortality rate of tuberculosis. Here the important fact is not so much the number that die annually from this disease as is the fact that it kills them during the period of their greatest usefulness, twenty-five to forty-five years. Diphtheria and scarlet fever have a greater mortality in early life, and cancer in advanced years, but the death rate from tuberculosis in middle life is even greater than that of pneumonia or heart disease. This death rate, however, is still slowly declining, as it has been doing during the past fifty years. Indeed it is a curious and noteworthy fact that the rate of decline was nearly as rapid prior to 1882 when Koch discovered the tubercle bacillus as it has been after this period. Fifty years ago, in Massachusetts, out of every 100,000 inhabitants there were 500 who died of tuberculosis; at present this number has been reduced to less than 150. These figures are approximately true, not only for Massachusetts, but for the rest of this country and for Europe. Some enthusiasts have concluded from this steady annual decline that in ten, fifteen, or twenty years there will be no more tuberculosis. This, unfortunately, is a Utopian dream that will not be realized. There is no doubt, however, that we are working in the right direction, and that sooner or later tuberculosis, even if it is not stamped out altogether, will at least be fairly well under control.

CHAPTER III.

THE TRANSMISSION OF TUBERCULOSIS.

OF all questions connected with the tuberculosis problem, none is more important than that concerning its transmission from one person to another, or from animals to human beings. Countless patients are asking: "How did I get consumption?" Fathers and mothers all over the world, in sorrow and despair, are asking themselves: "What did we leave undone, or what did we do that we ought not to have done that our child has tuberculosis?" Again the intelligent and conscientious patients are asking: "What can I do in the future, and how must I live so as not to give consumption to some one else?" These questions are natural and important ones; each should have as clear and definite an answer as possible. There is hardly one of us who has not seen almost an entire family wiped out by this disease. Years ago we would have considered this the hand of God; now we know that it means ignorance and carelessness on the part of some one, but exactly how and in what way many of us have only a very vague idea. We know that in some way in such a family as this, one member sick with consumption, although perhaps ignorant of the fact, gave the disease to the others. How did this happen? Was the disease spread through the air, by food, or by personal contact? Did the children inherit it from the parents, and if not, how did they contract it? These are practical points to be plainly and clearly answered.

Tuberculosis is not inherited. The cases where it has been proved that a tuberculous mother has transmitted the disease to the child in the uterus are so excessively rare that they need not be considered. If, then as we all agree, the germ itself is not transmitted from parent to offspring, is anything at all transmitted, and if so, what is it? We have frequently heard that a "gouty" or "rheumatic" tendency may be inherited. Does this hold true in regard to tuberculosis? Is there any tendency toward tuberculosis on the part of children of tuberculous parents? This is a question that has been long and hotly controverted. There are many who are strongly of the opinion that nothing at all is inherited; that the children of tuberculous parents are no more susceptible to tuberculosis than are the children of normal healthy individuals. On the other hand, although it is impossible to offer any definite proof to support their claim, there is an equal number of observers who believe that in many cases a constitutional susceptibility toward tuberculosis may be transmitted from parent to offspring. In other words, if one or both parents are tuberculous, the offspring may inherit a lessened degree of resistance against this particular disease; a child of tuberculous parentage on one or both sides may, but not necessarily does, offer soil especially favorable to the transformation of a tuberculous infection which, as has already been shown, few of us can escape into tuberculous disease.

Karl Pearson, for instance, from his extensive studies in statistics among tuberculous persons, is an ardent champion of the theory that the tuberculous "diathesis," which simply means a tendency toward tuberculosis or a lessened resistance to this particular disease, may be and often is handed down from father or mother to the child. As a matter of fact, however, no tuberculous father or mother need worry on this

point. The conscientious observance of the ordinary rules of health and hygiene will overcome any inherited tendency providing the child be protected from direct infection.

The important point, then, is for every one to know how direct infection takes place, and how to prevent it. We have already shown when this infection takes place, and that it is in the early years of childhood that the majority of persons become infected with the tubercle bacillus. What are the sources of such infection, and exactly how does it occur? The sources of infection are two-fold: human sources and bovine sources. Bovine tuberculosis, tuberculous disease of cattle, may undoubtedly be transmitted to human beings through milk and milk products. Bone, joint, and glandular tuberculosis are to a large extent caused in this way chiefly by germs of tuberculosis taken into the system in milk. Of the total number of cases of tuberculosis among adults, not over 4 to 6 per cent are from this source, but among children a much larger proportion of cases, doubtless more nearly 40 to 60 per cent, are of bovine origin.

Human tuberculosis is spread from one human being to another by means of the *sputum* which, in the case of a person with active consumption, may harbor millions of tubercle bacilli. These germs may be transmitted from one person to another either by direct contact, such as by kissing, or indirectly by the inhalation of germs from the sputum of a consumptive. Until comparatively recent times the theory of Cornet was the generally accepted one. He was the first to demonstrate that tuberculosis could be spread in dried and powdered sputum, and that in this form the germs were inhaled directly into the lungs and there caused the disease. This theory, although doubtless true in many instances, does not explain everything in regard to the transmission of tuberculosis. For instance, while the germs of tuberculosis

when moist may live for a long time, when in a dry and powdered state, and especially if exposed to sunlight, the germ soon dies. The tubercle bacillus is notoriously an easy one to kill—direct sunlight for twenty-minutes being enough to destroy its life. It is not altogether easy, therefore, to see how dried and powdered sputum, even if it does contain germs of tuberculosis, can be a very great source of danger, or at least such a great factor in the spread of consumption as was first thought. This ought not to mean that we should relax our efforts to do away with promiscuous spitting. Although the man who spits carelessly in public places or even on the sidewalk may not be a serious menace to others, the person who does this, in all likelihood will do the same thing in his home, where he will be a great menace to those about him.

Flügge modified this view as to dried and powdered sputum being the source of infection, and propounded what is now known as the theory of “droplet” infection. It has been shown many times, and anyone can prove this for himself quite easily, that the act of coughing and sneezing, unless the mouth is kept closed or covered, sends out into the surrounding air, for a distance of at least two or three feet, a shower of fine droplets of mucus or saliva. These, in the case of a person with active tuberculosis, may and usually do contain tubercle bacilli. These droplets containing live germs of tuberculosis may remain suspended in the air for quite a time, and are a most important source of infection. Other discharges, urine, feces, pus, etc., from tuberculous abscesses or sinuses, from their very nature are hardly to be considered among the important factors in the spread of tuberculosis.

The chief methods of transmission of tuberculosis, therefore, eliminating bovine tuberculosis are:

1. By means of "droplet infection," microscopic drops of saliva and mucus, containing live tubercle bacilli, which are propelled into the air by the act of coughing and sneezing, and while thus suspended are inhaled into the mouth and air passages.

2. By means of bacilli from dried and powdered sputum which, in the form of dust, are inhaled into the throat and lungs.

3. By means of direct infection by kissing, or by using the eating utensils of a consumptive, or in the case of children and infants especially, by the ingestion of food infected with tuberculosis by its having been carelessly handled by some consumptive.

Exactly what happens to the germ after entering the nose or mouth is still a matter of dispute. According to many, they are inhaled directly into the lungs and there grow, multiply, and later on cause disease; others support the view that these germs are taken up by the lymphatic system through the tonsils or otherwise, and thus get into the circulation by an indirect route and thence into the lungs; a third group of observers, headed by von Behring, maintain that the germs are swallowed along with mucus and saliva and from the stomach or intestinal tract are taken into the circulation and finally reach the lungs. These questions are of scientific rather than practical importance, and need not be considered in further detail here. Infection by direct injury—wounds, blows, etc., so called "traumatic infection"—is likewise too rare a source to be considered.

The time at which infection occurs, namely, in early life, has already been mentioned. Another question, and one most difficult to answer, is that concerning the frequency of adult infection. Under what conditions, if any, can an adult previously free from any signs of the disease actually

contract tuberculosis, or is every case of adult tuberculosis simply the breaking out into active disease of an old childhood infection? Undoubtedly an adult may receive an infection in addition to the one he has probably incurred in childhood, and it is quite easy to imagine that under *certain conditions* this additional burden may prove too much for his resistance, and thus be enough to cause active tuberculosis to develop. Opinion has changed greatly during recent years, however, in regard to the subject. The majority of observers are inclined to doubt whether the *normal healthy adult* is likely to contract tuberculosis except under very unusual circumstances.

These "unusual circumstances" that may render an adult more liable to contract tuberculosis, unfortunately are not so unusual as they should be. In the first place, as mentioned before, an individual, while apparently perfectly sound, may possibly have inherited a weakened resistance to tuberculosis. This will increase his chances of changing his tuberculous infection into tuberculous disease. In addition to this inherited low resisting power, anything which will temporarily or permanently lower resistance may favor the development of an active tuberculous process. The debilitating influence of any acute or chronic disease, accident, or injury, bad habits, alcohol in excess, unhygienic living or working conditions, and most important of all, poverty, any or all of these may be and too often are factors in causing an adult to become openly consumptive. Here again, however, we are confronted with the same problem, namely, if under these circumstances an adult comes down with active tuberculous disease, is it purely an awakening of a hitherto latent childhood infection, is it an overwhelming adult infection falling on fertile soil, or is it a combination of both? These are impossible questions to decide, and

fortunately whether we answer them or not makes little or no difference in our attitude toward tuberculosis and our warfare against it. The late war brought up the question afresh. A certain number of men who had successfully passed draft and other physical examinations developed consumption while in France. Here, whether in trenches or elsewhere, the conditions were certainly "unusual." Whether, in such cases as these, the men who thus came down with active tuberculosis did so because of an overwhelming infection from some comrade who had germs of tuberculosis in his sputum, although ignorant of the fact, or whether the disease was simply an awakening of a childhood infection hitherto quiescent, is a question we cannot answer. It is not wise, at present at least, to carry the theory that adult infection is rare or well nigh impossible, too far. There is much that we do not know about this subject even now. Although our campaign must be chiefly directed toward the prevention of childhood infection, we should still remember that adult infection may be and in all likelihood is possible, and therefore that we should take no chances. The important points to bear in mind in regard to this distinctly complex problem are:

1. The frequency of childhood infection. By the time the fifteenth year is reached, the majority of us are already infected with tuberculosis.

2. This tuberculous infection does not necessarily mean tuberculous disease, as shown by the fact that most of us remain healthy and strong and never show any signs of tuberculosis.

3. Under certain conditions, as mentioned above, this tuberculous infection may become awakened into active tuberculous disease.

4. An overwhelming superadded adult infection may be

a contributory factor, great or small as the case may be, in this awakening process.

5. The average adult, as long as he remains healthy and strong, need have no worry about contracting tuberculosis. It is our duty, however, both to ourselves and the community, to so order our lives and to help others to do so, that the number of those who do become actively consumptive shall be reduced to the lowest possible figure, and to see that conditions under which we are living, working and playing are healthful, and are contributing toward this end.

CHAPTER IV.

THE COST OF TUBERCULOSIS.

THE cost of tuberculosis is four-fold, the cost in lives, the cost in disability, the cost in happiness, and the cost in money. It is a difficult task to estimate such intangible factors as the cost of a world-wide disease such as tuberculosis under any of the four headings here referred to. The cost of an individual case, however, can be closely approximated. Take, for instance, the example of the man who comes down with typhoid fever. There is, first, the cost in unhappiness which means worry and anxiety on the part of family and friends, which is often reflected in the subsequent poor physical and mental condition of those who have borne the burden. Then there is the cost in money, which is in turn two-fold, including as it must both the loss of earning power, what the patient would have earned had he been well and continued at his work, and also the cost of medical attendance, bills for the services of doctor or nurse, hospital bills, extra food, expenses during convalescence, etc. This in the individual case can be calculated minutely. If the patient in question is fortunate enough to carry some form of health insurance, a part of this expense is provided for, but a portion at least of the cost of what he pays for such insurance must be added to the cost of the disease itself. The cost in disability, in this particular instance, is included in the cost in dollars and cents.

In regard to the cost to the community from the death

of any individual, "the expectation of life," to use a life insurance phrase, can be calculated in the case of any person, at a given age. Knowing the earning capacity of this individual, it is a simple matter to calculate from this how much of a loss in dollars and cents his death will entail to the community in which he lives. Therefore, it is clear that in the individual case as here described, the cost in all these factors can be fairly closely estimated, and it is amazing to what a figure the cost of a comparatively short disease such as typhoid fever will reach if calculated in detail. But compare this however, large as it is, with the cost of the average case of tuberculosis. Let us suppose that a man of thirty-five, with a wife and three or four children, comes down with tuberculosis and is advised to go to a sanatorium. Take it for granted that he is in the same position as is the average working man; namely, that he is able to support his family and himself comfortably while he is regularly at work, but that he has little or nothing saved up for just such an exigency as this. Although he himself may have to pay only a small sum per week for his board at the institution, or, as would be the case in Massachusetts and in many other states, he can go as a free patient, if his circumstances warrant it, some one will have to pay his expenses, and that some one in the ultimate analysis will be the tax-payer as represented by the Commonwealth. At the present time the average cost of board per week at state sanatoria is from \$13 to \$16. The average length of stay of patients is approximately six months. Therefore, taking \$15 per week as a fair figure, the actual cost to the community for this man would be \$360. This, however, is only the beginning of what this one case of tuberculosis will cost. Consider, for instance, that this man is able to earn \$30 a week. It is fair to state that he has been incapacitated for a few weeks previous to his illness, and that

there will be a loss in this case of perhaps thirty weeks' pay, amounting to \$900. Add to this the cost which must be paid by some one, relatives, friends, or more likely the town or city in which the man lives, to support his wife and family, which may be calculated at least as high as \$25 a week, which would amount to \$750 more. Now let us consider that this man is discharged as an apparently arrested case, which unfortunately is not true in every instance. His physicians decide that it is impossible for him to go back to his old occupation, but that he must seek some easier job. This he does, but usually at reduced pay, and so it goes on, cost added to cost, until this one case of tuberculosis will be found to have been a burden from the financial point of view alone, to the State in which it existed, to the extent of many thousands of dollars. Multiply this one example by 200,000, which is approximately the number dying of tuberculosis during recent years in this country, and one reaches a figure that is simply appalling, and yet which is doubtless far inside the truth.

During the course of any large strike, or after it is over, we frequently read in the papers statements as to exactly how much this strike has cost the manufacturer in question, and as to how much it has cost the laborers or the labor union involved. Here again the cost can be calculated, intangibly perhaps as regards happiness, but fairly definitely as regards disability and actual dollars and cents.

The most striking example of the cost of any disease is that of the influenza epidemic which swept over the world during the winter of 1918-1919. Is there one of us, in this community at least, who was not affected in one or even all four of the ways here referred to, by this disease? Is there one of us who did not suffer a greater or less degree of unhappiness through the ravages of influenza? The death rate

was appallingly high, and the loss in dollars and cents to the community has been calculated as running up into the many millions, while the loss in disability on account of the mental and physical depression following this disease for many weeks and months was proportionately great. This has been impressed upon us in countless ways.

In the case of tuberculosis it is familiarity that breeds contempt. Compared with the annual loss from consumption, the cost of this influenza epidemic, while it cannot be regarded as trivial, was certainly vastly less than that of tuberculosis during the same period, and yet how few of us there are who realize the amount of money that tuberculosis is costing the community, and the amount of money that is being spent every year to combat it.

The value of the average adult human life to a community has been conservatively estimated as being worth something in the neighborhood of \$1800 or \$2000. At the present time, in these days of high prices and high wages, this estimate might be doubled and be nearer the truth thereby. Taking as a rough estimate that 200,000 persons die annually of tuberculosis in this country, and multiplying this by 2000, one sees at a glance what an appalling loss to the community tuberculosis is causing.

Victor C. Vaughn has calculated the cost of tuberculosis to this country to be \$150,000,000 annually, but his estimate is based on figures at least four or five-years old. Darlington of New York places this figure at \$330,000,000 as the annual loss from consumption. Irving Fisher believes that the average loss from a consumptive wage earner is approximately \$8000, so that his calculation as to the annual loss from tuberculosis reaches the astounding figure of \$1,600,000,000. Herman Biggs agrees with Darlington that the yearly cost is approximately \$330,000,000. These figures,

of course, mean little or nothing except to impress upon the public that almost any amount of money spent in controlling tuberculosis is a sound investment, even if looked upon purely from the dollars and cents point of view.

With this point in mind, it is well for us to consider the amount that is now being spent every year in this country to control this disease. In 1905, \$5,000,000 was spent on tuberculosis; in 1915, \$22,500,000 was the sum devoted to this purpose, in 1918, involving as it did extra expenses for the war, the amount was far greater. Ten years ago the various antituberculosis associations in this country spent approximately \$100,000 in their work, while in the year 1920 they spent over \$4,000,000 for the same purpose. There are now over 600 sanatoria and hospitals for consumptives in the country, whose appropriation for the year 1920 was considerably over \$20,000,000. The State of Massachusetts alone recently spent \$1,500,000 for this cause, and it should be borne in mind that this sum does not include the money spent for the care of the families of consumptives by the Overseers of the Poor, Mothers' Aid, private relief agencies, and funds devoted for the care of families that have become dependent because of tuberculosis.

What makes tuberculosis an especially costly disease is because the period at which it is most likely to break out is during the period of man's greatest usefulness, from his twentieth to his thirty-fifth years. The diseases of childhood, including infantile paralysis, to a large extent do their harm before the individual in question has become a great economic asset to the community, while on the other hand, cancer and the so-called diseases of degeneration, namely, chronic heart and kidney disorders, hardening of the arteries, and all those other conditions accompanying old age, while most potent causes of death, do not cause such a great economic loss to the country.

The loss by consumption from every point of view, in lives, disability, happiness and dollars and cents, is infinitely greater in those communities most affected by immigration. It is in the cities along the Atlantic sea-board, which are flooded with newcomers who are forced to live under new and strange conditions, and whose resistance to tuberculosis under these new methods of living is slight, that the ravages of consumption are the greatest. Again, and intimately connected with the cost of tuberculosis, is the question of poverty. Consumption and poverty go hand in hand. The tenement house district yields a tuberculosis morbidity three times or more greater than that in the districts where better housing conditions prevail. In 197 families in Cincinnati, in each of which there was one or more cases of tuberculosis, the average monthly income for a family of four was approximately \$57. Such a low subsistence rate works havoc in the spread of tuberculosis. Tenements, cheap lodging houses, ignorance, and poverty are the great factors in causing the enormous cost of this disease. As R. W. Philip says: "Tuberculosis is an expression of an incomplete civilization. The social faults of which it is the register are especially deficient aëration and overcrowding. So far efforts have been too largely devoted toward the individual patient rather than toward the disease as a social malady. The question is not how best to recover a certain number of sick persons and to render them fit to resume work and earn bread and butter once more." It is a far greater problem than this. As Christopher Easton says: "Tuberculosis is a social malady caused by social neglect, and the cost of it, therefore, for the most part should fall on the community and not on the individual." Darlington, in referring to the enormous cost of this disease, which he calculates at something over \$330,000,000 a year, strikingly says: "One-

tenth of this amount spent at the right time in the right place for prevention would probably eradicate the disease in a few years." Biggs summarizes this general subject clearly and tersely: "The preceding calculations are merely given as illustrations of the terrible national loss of money and efficiency caused by tuberculosis. They fail to show the full extent of the mischief wrought. Looking at the subject from the standpoint of national economics, it is not open to dispute that the most elaborate and complete measures of every description against tuberculosis would only cost a fraction of the present total loss inflicted by the disease, and that the expenditure would, as time goes on, be paid for many times over in the prevention of sickness and increase of efficiency to the community." Supplementing this, Fisher tells that: "The cost of treating patients in sanatoria is repaid many times over in lengthened working lives," and that "the erection of hospitals for incurable and advanced tuberculous patients is probably the most profitable method of reducing the cost of tuberculosis."

In a recent investigation of the present condition of 1000 patients discharged from the Massachusetts State Sanatoria some years ago, interesting points came up bearing on this question. During the last few years especially there has been an increasing number of "doubting Thomases" who have asked the question, "Are our sanatoria worth while? Is the vast amount of money being spent on sanatoria and hospitals for consumptives a sound, economic investment?" These are proper and right questions to ask, and it was partly to answer such questions as these that the investigation here referred to was undertaken. At the time this study was made, the actual cost to the State of Massachusetts per week per patient was approximately \$9.50. Thus these 1000 patients during their stay in the sanatoria cost the

State of Massachusetts \$9500 a week. Whether this money was paid from private sources, local boards of health, or by the state itself, is immaterial; the money came from the State of Massachusetts. This cost, of course, does not include those other items mentioned above, for the relief and care of the patient's family, etc. Of the 1000 patients who had been discharged from the sanatorium one to five years previously on whom this study was based, nearly 312 were found to be alive and in such condition that they were able to engage in regular work. A careful inquiry was made into the earning capacity of these 312 patients, and it was found that the amount they were then earning totaled approximately \$3000 per week. This amount did not include the potential earnings of certain men and many women who were quite able to work, but for various reasons were not doing so. Granting that the average length of stay of each of these patients while in the sanatorium was six months or under, it is easy to see how in a few years' time these 312 patients will have earned enough to more than offset the total cost to the State of Massachusetts of the 1000 original patients during their stay in our sanatoria.

These figures are given here in detail in order to show as clearly as possible that money properly spent for tuberculosis is money well spent. The public is coming to believe, as many physicians and scientists already believe to be true, that the average healthy adult does not contract tuberculosis, and need have no fear of so doing under ordinary conditions of life. As a corollary the public is coming to ask why, then, "should there be sanatoria and hospitals at public expense, and at little or no cost to the patients themselves, for tuberculosis rather than for patients with chronic diseases of the heart or other organs of the body?" It is needless to point out the fallacy in such arguments as

this. It is the aim of this chapter, however, to make it as clear as possible that, no matter how great the sum of money that is appropriated for the purpose of erecting and maintaining hospitals for far advanced consumptives, sanatoria for the incipient and favorable cases, preventoria, and open air schools and rooms, for dispensaries and clinics, and for nurses, this money will be well spent and will be a sound and economic investment.

CHAPTER V.

HOSPITALS AND SANATORIA FOR CONSUMPTIVES.

FOR many years the word "sanatorium" and sanatorium treatment has been connected in people's minds with the words tuberculosis and consumption. It was in 1870 in the Black Forest in Silesia, in the little village of Goebersdorf in Germany, that Brehmer established the first real sanatorium for consumptives. His successor, Dettweiler, carried on the work in Europe, and in the early eighties in this country Dr. Edward Livingston Trudeau blazed the trail, and at Saranac Lake—then a little village of native hunters and fishermen—in 1884 established the Adirondack Cottage Sanatorium, since his death more fittingly called the Trudeau Sanatorium. This institution was not only the first of its kind in this country, but now stands for all that is best in the treatment of consumption.

Spurred on by the success of this sanatorium, others were soon started, but mostly in the mountains or at least at a considerable distance from the sea-coast. There was supposed to be something particularly beneficial in mountain air, and something about the air among pine forests, presumably laden with "ozone," that made it almost essential that an institution for consumptives should be located in such regions. There was likewise prevalent at that time a strong impression that sea air was harmful, and that no consumptive could thrive in an institution at a low level or near the sea. The fact, therefore, that most of our sanatoria were inland at

distant mountainous regions made it difficult, in many instances well nigh impossible, for these institutions to be used by those most in need of them. Accordingly, Dr. Vincent Y. Bowditch of Boston, realizing this unsatisfactory condition of affairs, and also firm in the belief that consumption could be cured on the sea-coast and at low altitudes, providing the sanatorium idea of carefully regulated outdoor life could be carried on, built a private sanatorium at Sharon in the State of Massachusetts. This town, at a very moderate elevation, is only ten miles from the sea-coast. The truth of Dr. Bowditch's theory, while at the time considered an almost revolutionary one, was demonstrated in the successful treatment of patients at the Sharon Sanatorium and led the State of Massachusetts to appropriate funds for the construction of the first state institution for consumptives in this country. This was built in 1898, and is now widely known throughout this country as the Rutland State Sanatorium. It is situated fifty miles inland at an elevation of 1200 feet, which as far as altitude is concerned amounts to little or nothing. The results here obtained, however, are equal in many respects to other sanatoria although situated at far higher altitudes and much farther from the sea-coast. Since 1898, when there were only a few private sanatoria and only one state institution, the number of such sanatoria in this country has increased to a wonderful extent, so that at present there are over six hundred state, county, municipal or private sanatoria and hospitals for consumptives, providing a total of many hundred beds, and representing an outlay of millions of dollars. The immense sum devoted to the construction and maintenance of such institutions is a clear indication of the importance with which they are regarded as factors in handling tuberculosis.

It is important that everyone should have clearly in mind

the exact purpose for which the sanatorium for consumptives is intended and its difference from the hospital for consumptives. A hospital is intended primarily for the patients who are in the advanced and progressive stages of the disease, where the patient is given every opportunity to get well, if possible, but where the primary object of treatment is to make the patient comfortable and as happy as possible during the latter days of his life, and of still greater importance to prevent him from infecting others. It is, of course, the advanced consumptive who is daily raising a large amount of sputum containing millions of tubercle bacilli who is the great source of infection. The location and general make-up of the hospital for consumptives is bound to be, therefore, radically different from that of the sanatorium. It is unnecessary to go into details here concerning such institutions as this. No one type of construction is necessary, nor need such an institution differ much from a hospital where patients gravely ill with other diseases are cared for, the primary object being, as mentioned before, to give the patient a chance to get well, but at all events to keep him as comfortable and happy as possible, and to keep him from infecting others. This it is difficult and well-nigh impossible to do in the home. The most important factor which will go to make a hospital for consumptives a popular institution, where the beds are kept filled, is its accessibility. An institution for this type of patient, no matter how beautifully built and how pleasant its surroundings, and how well-equipped, will fall short of the purpose for which it was intended, if it is so situated that relatives and friends are not within easy reaching distance of the sick patients in the hospital. The importance of this cannot be over-estimated.

Coming to the sanatorium, however, the case is quite different; while accessibility is an important factor, it is not

such an important one. In regard to altitude, we no longer look upon this as essential. The altitude of the sanatorium at Saranac Lake is in the neighborhood of 2000 feet, that at Rutland 1200 feet, that at Sharon less than 100 feet, while there are of course many institutions in Colorado and the West located at a far greater altitude. The results in all these institutions are approximately the same, so that it may be safely said that altitude in itself is of comparatively little importance as far as the sanatorium is concerned. In regard to its accessibility, if there are two sites equal in other respects, the one which is the easier to reach is better not only for patients, but for provisions, coal, etc. In the State of Massachusetts each of our four state sanatoria can be reached in a comparatively short time, so that a patient's friends can go to any of the sanatoria in the morning, visit the patient, and return in the evening. In New York State, however, and in many others, this is quite impossible. The New York State Sanatorium for incipient consumptives is in the Adirondacks at Raybrook, not far from Saranac Lake, and a twelve hour trip or more from the homes of many of the patients. Despite this, because of its many other advantages, it has an enviable reputation.

In regard to construction of a sanatorium we come at once to two main types; one, the cottage idea, or separate pavilion plan, of which the Trudeau Sanatorium is a striking example, and the other, the single unit plan. According to the first plan, there is a central heat, light and power plant, a central administration building, including the dining-room and kitchen, and separate cottages or pavilions for patients containing from four to twenty-four beds, while in addition there is usually an infirmary for the sick patients. This has obvious advantages, particularly in a state institution, in that it allows a certain amount of segregation and grouping

of patients of different races, creeds and nationalities, as well as those in the different stages of the disease. Its chief disadvantages, consist in its difficulties of administration. The single unit plan for a sanatorium is much simpler in this respect. The number of buildings is much less, and there is a correspondingly increased efficiency in administration. There are fairly large wards of sixteen to thirty beds, smaller wards for the sicker patients, and private rooms of from one to four beds for private patients or for those in the far advanced and terminal stages. The question as to which plan is to be adopted is often decided by the size and physical characteristics of the site on which the institution is to be built.

For the private sanatorium where wealthy or moderately well-to-do patients are cared for, the more opportunity there is for segregation according to lines described above, the better. For many state, county and city institutions, a compromise between the two extremes is the best solution. The construction of a sanatorium therefore depends upon circumstances. If the site is of sufficient size to permit it, there are many advantages in the low rambling, one-story type of building, particularly in reducing the danger from fire. The question as to whether wood or a more permanent material, such as brick, stone, or concrete, should be used, is again one which may be arbitrarily decided by the fire regulations, or, as is more apt to be the case, by the amount of money available. The more permanent type of construction will, in the long run, prove most economical in the majority of instances. The success of any sanatorium for consumptives, however, does not depend so much upon its location, elevation, or its construction, or the type of building as it does upon the type of man who is its superintendent and upon the others, physicians and nurses, whom he gathers about him.

Treatment itself, "taking the cure" as it is called, consists of nothing more or less than leading a carefully regulated life, according to rules laid down to include the minutest detail. Much depends upon the ability of the patient to understand and his willingness to abide by such rules and regulations. The daily routine of a patient in the incipient stages of the disease might well be somewhat as follows: Rising in the morning from his bed on a sleeping porch or piazza, he dresses in a warm room, and goes to breakfast. After this he takes the cure in his steamer chair out of doors until the middle of the morning when, if he is underweight, or his physician believes it wise, he is given a light lunch. If he is allowed exercise or occupation of any sort, this is taken in definitely regulated doses. If he is allowed to walk, the exact distance or the exact time he can devote to this purpose is clearly specified. If he is allowed occupation of some kind, here again this is done under careful supervision for an exact period. After dinner, in the middle of the day, there is a rest period of one hour which the patient spends lying down usually on his bed. The rest of the afternoon again is spent either keeping absolutely quiet in his steamer chair, or, if he is permitted to do so, doing a certain amount of work. He never comes from his work, or walk, as the case may be, and sits down at once to a meal. There is always a rest period of half an hour before each meal. In the evening he either takes the cure until bed time, or, if allowed to do so, he may indulge in some form of recreation.

The question of rest versus exercise in the treatment of consumption has been a hotly fought one. Up to comparatively recently, exercise—carefully regulated—was considered beneficial in many instances. Then there came a period when we went almost to the other extreme and kept our patients at absolute rest, not only physically but mentally

as well, for indefinite periods. This in many cases resulted in patients becoming overladen with fat, and sinking into a state of mental stagnation. At the present time we are trying to individualize in each case. We are trying to develop forms of occupation, which, while they produce little that is of economic value, do result in keeping the patient mentally and physically in a healthy and happy state.

As far as diet is concerned, the days of stuffing are now past. Indeed, the custom of the light lunch, the glass of milk, the cup of broth, sandwich, or cracker, given in the middle of the morning and the middle of the afternoon, is now in many cases being given up altogether. Here again, it is not safe to generalize. There are many patients who can with profit eat such extra nourishment, and who do not lose their appetite for the ensuing meal by so doing, and for such patients these lunches are valuable. It is the general consensus of opinion, however, that in many cases such lunches are not only unnecessary, but do harm rather than good.

Just as the question of occupation for consumptives is important, so of equal importance in any institution is that of diversion. In the annual budget for every well run sanatorium there will be found a surprisingly large amount coming under the heading "entertainment." Plans for the celebration of Christmas, Fourth of July, Thanksgiving, and other holidays are made long in advance, and there is a weekly schedule of moving pictures, concerts, lectures, etc., all of which is absolutely essential to the breaking up of the patient's deadly routine, and giving him cheer and courage to continue at his difficult task of regaining his health.

In addition to this comes the question of discipline. In private institutions where there is a small group of patients, usually of a fairly intelligent class, this is not so important.

In a large public institution, however, the question of discipline and the means of maintaining it is a problem with which the superintendent is eternally confronted. While in a sanatorium for civilian patients the military regime is impossible and will not be tolerated for a minute, there must be a certain set of rules and regulations which are to be strictly adhered to. The superintendent must, at the risk of making himself very unpopular, be ready to discharge any patient at any time who repeatedly refuses to live according to these rules and regulations.

The question of segregating the sexes in separate sanatoria is another frequent topic of argument and discussion. As a general proposition, separate institutions for men and women consumptives are not looked upon with favor. While it is acknowledged that children should be treated in separate institutions or else in a sanatorium for women and children alone, experience has taught us that for adults it is more satisfactory and in the long run brings about better results to have men and women under the same roof. This does not mean that the strictest rules of segregation must not be laid down and adhered to in regard to promiscuous mingling of the sexes. At the Massachusetts State Sanatoria there is a definite line dividing the grounds which are allowed for men, and those for women. If a man or woman is found on the wrong side of this line, singly or in company with others, he or she is at once discharged. At the evening entertainments, however, and in the dining-room, men and women mingle together and profit thereby. As far as children are concerned, as mentioned above, either a separate sanatorium or an institution where only women and children are received seems to work out most satisfactorily.

At the present time many people are asking the question, "Are sanatoria worth while?" This is a question which

naturally arises in the mind of any one who sees a patient, discharged from a sanatorium apparently healthy and well, relapse into his old condition or into a worse condition than before. What are the results of our sanatoria in terms of dollars and cents, and in terms of health and happiness, and what can we legitimately expect in the way of the arrest of tuberculosis, and the return of patients to their homes as useful citizens once more? Statistics in regard to this are at the best uncertain and unreliable. The immediate results of treatment mean little or nothing. In the annual report of any sanatorium one can find, if sufficiently industrious, among the statistical tables at the back of such a report the percentage of patients discharged as "arrested" or as "apparently arrested" or "improved." These figures are interesting and impress the public, but amount to nothing. They depend upon the stage of the disease on admission, and the length of treatment in the sanatorium, and give no indication as to how long the patient will continue to remain in good health. The only way we can really get at the end results of our sanatoria is to make a study of the present condition of patients who have been discharged from institutions several years. In addition it should be borne in mind that any conclusion based on figures concerning patients whose length of stay in a sanatorium was less than six months is of comparatively little value. Tuberculosis is rarely, if ever, arrested in less than six months' time, and the efficiency of any sanatorium for incipient consumptives may well be measured by the length of stay of its patients, just as the efficiency of a hospital for advanced consumptives may be measured by the percentage of patients who die within its walls. The average length of stay at the Rutland State Sanatorium is in the neighborhood of six months. In many institutions there is a limit of one year's residence, at the end of

which time the patient is automatically discharged. At Rutland there is a two-year limit of residence, which might well be reduced to eighteen months. At the other Massachusetts State Sanatoria there is no limit, at present at least, to the length of the patient's residence.

The results of sanatorium treatment again depend not only upon the patient's length of stay, but upon the stage of the disease upon admission. The results in a sanatorium which receives all classes of patients except the very far advanced will naturally be different from those in an institution receiving only so-called incipient cases. It is a curious and noteworthy fact, however, that in practically no institution whose beds are reserved for incipient and early stages only, is there a percentage over 50 of this class. At many institutions it is seldom, if ever even as high as this. At the Rutland State Sanatorium the percentage of incipient cases varies from 22 to 38 per cent, the latter being the highest figure it has ever reached. The proportion of bed and presumably advanced cases is 12 per cent.

The whole question of the results of our sanatorium treatment is so intimately bound up with the treatment of the patient after leaving the sanatorium—after-care work—that it is difficult, if not impossible, to tell which factor is most important, treatment in the sanatorium or the treatment of the patient after he leaves the sanatorium. This latter subject will be considered in a separate chapter. As a general rule, it is safe to say that of the incipient cases in a well run modern sanatorium, where the average length of stay is six months or over, a proportion of 60 per cent to 70 per cent or even higher will be discharged with their disease apparently arrested, and a still higher proportion as quiescent. If we include in our calculations the entire group of patients in a sanatorium reserved for "early and incipient cases,"

the proportion of those discharged as apparently arrested or quiescent will vary from 40 per cent to 50 per cent. This, it is to be borne in mind, means the condition at discharge, and does *not* mean permanent results.

The end results or permanent results of sanatorium treatment are difficult to obtain in concise and accurate form. In a detailed investigation of over 1000 patients discharged from the Massachusetts State Sanatoria one to five years previous to the time the investigation was carried on, interesting facts were brought to light. On admission 17 per cent of these 1000 patients were classified as incipient, 36 per cent as moderately advanced, and 46 per cent as far advanced. When the present condition of these patients was investigated, which averaged two and a half years after discharge, it was found that 29 per cent were in good condition and at work, and that 45 per cent had died, and that the remainder had either disappeared or were still sick and in need of sanatorium care. These figures, based on Massachusetts patients, correspond closely with those of investigations carried on elsewhere. They mean comparatively little, but certainly demonstrate the need of prolonged sanatorium treatment and of careful observation and supervision of the patient after leaving the sanatorium.

Bulstrode, considering the value of sanatoria in the tuberculosis campaign, concludes as follows: "It appears that the immediate results of sanatorium treatment are in the majority of cases encouraging, and that the degree of improvement is in direct relation to the earliness and suitability of the cases. As regards the after-results, there are fewer data on which to base conclusions. The omission on the part of sanatoria to publish after-results is due, in a considerable degree, to the disparity between the actual results obtained and the optimistic prophecies made by some persons as to the inauguration of the sanatorium movement."

Bardswell, who has made a careful study of this subject, is a firm believer in the value of the sanatorium. In his mind it is not a question as to whether the sanatorium is or is not an aid in our campaign against consumption, but rather as to the degree of benefit it is to us. In too many instances the gain is a temporary one only, but even this is a distinct improvement over anything offered by treatment a few years back. Undoubtedly, the wave of optimism as to the ease with which consumption might be cured has done harm. The disease still remains one of the most difficult to cure. A more general realization of this fact would save much sorrow and disappointment. On the other hand, no disease responds to proper treatment more easily than this even if the benefit is not always a lasting one.

There are many who in the past, and even at present, have persisted in their belief that home treatment, properly carried on, is more efficient and more economical than sanatorium treatment. The majority of the workers in the field of tuberculosis and public health, however, are not of this opinion. Until some specific remedy for the disease is found, which will probably never happen, or until the human race, or that part of it, at least, which lives the so-called civilized life, becomes immune to tuberculosis, which will be many, many years from now, the sanatorium and all that the name implies, including detailed supervision of the patient while in the institution and equally detailed and careful supervision for months after the patient has left the institution, is one of the best weapons we have not only to combat the individual case of tuberculosis, but to control the disease as a whole.

CHAPTER VI.

THE AFTER-CARE OF CONSUMPTIVES.

THOSE of us who are interested in stamping out tuberculosis are gradually coming to realize that no system of sanatoria, no matter how complete and elaborate as to location, number of beds, surroundings, etc., can by itself solve the tuberculosis problem. We have come to realize that the patient's stay at the sanatorium or hospital, short or long as the case may be, is but an incident in a course of treatment, the most important parts of which are before the patient enters and particularly after the patient has left the sanatorium.

It is the care and supervision of the patient after he has left the sanatorium that constitutes what we call "after-care work." In other words, a patient leaving a sanatorium after a six months' stay with his disease arrested or quiescent, as the case may be, according to the old system under which "after-care" was unknown, went back to his home, resumed his old occupation if he was able to do so, no matter how unsuitable it was, or else tried to find that will o' the wisp, "a light out-door job." The result in far too many instances was that he broke down in a few months' time and found himself in worse condition than before, with the task of regaining his health still confronting him. Under an ideal system of "after-care," this ought not to happen except in rare instances. Some time before the patient was ready to leave the sanatorium, the superintendent or, better still, a

nurse or social worker especially delegated to do this, would have been in communication with the patient's physician or the local dispensary, and would have acquainted doctor and nurse and other local health authorities with the details of this man's case. His old employer also would have been notified that this man was leaving the institution and was, as the case might be, able to take up his old occupation *under supervision*, or must have a lighter one. His family, too, would have been consulted and advised as to what steps they should take at home to keep the patient in question well and to protect themselves from infection. Thus when the patient actually left the sanatorium, his future course would have been a clear and definite one. Kindly instructions would be given him on his discharge, he would be urged to report once a month regularly to his physician or dispensary, who had already been notified as to his physical condition beforehand, and he would be informed regarding the danger signals of a relapse and what to do about them. In addition to this, shortly after his return home, within a month at least, some nurse or social worker would visit him and his family and give advice and suggestions. This is efficient "after-care work." There is probably at present no community and no sanatorium where it has reached such a high stage of development as described here. It is an ideal toward which every sanatorium may well aim, however.

After-care work may be detailed or superficial, efficient or inefficient, according to the standards of health work of the community. In far too many cases, the physician, whether acting in his own private capacity or in connection with some dispensary or out-patient department, heaves a sigh of relief when he has finally sent his patient off to some hospital or sanatorium, and sits back with a feeling that at last his duty is done, and well done.

The average length of stay of patients, in our best state sanatoria, is somewhat over six months. Although it has been an encouraging feature to note how this length of stay has gradually increased from year to year, every one at all conversant with the chronicity of tuberculosis realizes that this disease is practically never cured and only rarely arrested in this period of time. It is, therefore, of the utmost importance that the supervision and treatment of the patient be uninterrupted from the time the diagnosis is made, during the period that he is at the sanatorium and for some time after he has left the sanatorium, short or long as the patient's needs may indicate. Only a clear realization that this after-care of the patient is an integral and necessary part of what the sanatorium is trying to accomplish will prevent the tremendous economic loss that now takes place.

The difficulties in the way of carrying on such work efficiently are manifest. Over 50 per cent of consumptives in sanatoria in our eastern states at least are of foreign parentage and a very large proportion were themselves born in a foreign country. The mentality of many of these patients is of such a low grade that efficient after-care work is practically impossible. Among others of high-grade intellect, inherited constitutional weakness or utter lack of ability to adapt themselves to new methods and conditions of living as found in this country, prevents after-care work from accomplishing much of anything. Nevertheless, there still remains a large number of patients who will repay in terms of increased health and efficiency and length of life any efforts spent in their after-care. This group will grow larger and larger as the public is educated to realize the urgent necessity of this part of the tuberculosis campaign.

After-care work may be carried on according to three plans. First, usually the case in those communities in which

there is only one sanatorium which has been the leading feature in the antituberculosis campaign, it is the sanatorium itself which carries on this task, usually unfortunately regarding it as a more or less minor detail. This of course is quite natural, as in any institution it is the patient within its walls and not the one that has left its doors who receives the most attention. According to the second method, all the sanatorium does is to notify local agencies that this or that patient is about to be or has been discharged. It then becomes the duty of the local board of health or the private physician to look up this patient and guide his way during this critical period after leaving the institution. The third method of carrying on after-care work, and undoubtedly the best, is one by which all agencies, the sanatorium, state and local boards of health, private physician and state and local nurses coöperate to bring about proper supervision of the patient.

The development of after-care work in Massachusetts is an excellent example of the evolution of this part of the antituberculosis campaign. Up to 1912, except in rare instances and in a distinctly haphazard fashion, after-care work did not exist in Massachusetts. The patient who left a state sanatorium, either with the consent or against the advice of his physician, returned to his own home and acted as he thought best in the matter of medical advice and supervision. If sufficiently intelligent, he at once placed himself under the care of his family physician or went to some local dispensary. If not, he immediately hustled around to secure a job and went back to work usually quite regardless of anything he had learned at the sanatorium.

In 1912, the Boston Tuberculosis Association, realizing this unsatisfactory state of affairs, made an offer to the State Tuberculosis Commission to provide for a period of six months a social worker or "after-care nurse" who during

this time would devote herself to the task of looking up and visiting and assisting in every way possible the patients discharged from the Massachusetts State Sanatoria. This was to be in the nature of an experiment, both the Tuberculosis Association and the State authorities, hoping, as turned out to be the case, that the need of continuing and of enlarging upon this work would be clearly demonstrated. The State naturally enough accepted this offer and at once appointed Miss Bernice Billings as its first after-care worker, and the first not only in Massachusetts but in this country. Miss Billings filled this position admirably, and has done pioneer work of the finest type in this new field.

Her task was an enormous one. There are four state sanatoria in Massachusetts, with a total of over 1000 beds. It was Miss Billings's duty to visit every patient leaving each institution, as soon after discharge as possible, to become acquainted with the patient and his family, to make a detailed report of home conditions, and to give advice either directly to the patient and his family, or indirectly through some local agency as to work, methods of living, protection of others, etc. One of the most important parts of her work, and one that has had far-reaching results was to interest local boards of health, local public health or dispensary nurses, and the local physicians in what she was doing so that she could gradually obtain the coöperation of all these agencies. That she was able to accomplish this is shown by the fact that Miss Billings was able to cross town after town and city after city off her list, knowing that in these communities her task was accomplished, and that there at least after-care work would be well and efficiently done. This, as time went by, left her free to devote her energies to the smaller towns and cities, and especially the scattered agricultural communities.

To help in her work, and to prepare the way for her, a

system of discharge letters was introduced. Upon the discharge of any patient from any state sanatorium, the superintendent at once wrote a letter to the central office of the Board, giving the patient's date and stage of disease on admission, the date and stage of disease on discharge, the progress he had made, his conduct, his attitude toward his disease and his physicians while in the sanatorium, and advice for the future. Copies of this letter were sent as soon as possible to the patient's private physician, if he had one, to the local tuberculosis dispensary, and board of health, and to any other interested individual. Thus by the time Miss Billings made her visit, facts concerning the patient were already at hand, and some of the work already done.

Two such discharge letters are here given:

March 20, 1913.

MY DEAR DOCTOR: E. C. was admitted to the Rutland State Sanatorium December 9, 1912, on an application made out at the Boston Consumptives' Hospital. He was discharged March 19, 1913.

He was admitted as an incipient case of pulmonary tuberculosis, and was discharged with the disease 'arrested.' At the time of admission there was slight dulness to the third interspace, at the top of the right lung and a few fine rales both back and front. At the time of discharge there was suspicious dulness at the apex, but no rales were heard. The patient seemed to be in excellent physical condition, and I believe he will be able to take up some clerical work, such as he had been doing, and if he uses reasonable precautions he will probably be able to live very well in Boston.

I advised him to return to your clinic to be examined occasionally.

Very truly yours,

Superintendent.

July 3, 1913.

DEAR DOCTOR: This is to inform you that Mr. J. B., admitted to the North Reading State Sanatorium July 1, absconded at 7 A.M. today. He is a moderately advanced case of pulmonary tuberculosis, expectorating about two ounces of sputum per twenty-four hours, in which tubercle bacilli are exceedingly abundant. He has vesperal fever and other signs of marked disease activity.

As far as can be learned, this patient said that he left the institution because he did not like it here. He told the patients that he wanted to get out and celebrate the Fourth.

This patient has not been in the institution long enough to show any improvement, but he has shown that he needs treatment immediately and isolation from healthy people, as he is no doubt a very infectious case.

Very truly yours,

Superintendent.

Miss Billings continued her work until 1917, when it was decided that her task was such an important one that it must be further developed and enlarged upon. Accordingly she was transferred to the State Department of Health where she was placed in charge of a corps of nurses who under her direction were to carry on her work. Unfortunately, as often happens even in the most sincere attempts at progress, under this new system, which theoretically should have brought about a steady improvement, such improvement did not take place; the personal touch, which in work of this kind is of vital importance, seemed to have been lost. Miss Billings no longer came into contact with the patients, and the nurses under her, chiefly through lack of training and because of other duties in addition to after-care work, became mere

collectors of statistics rather than anything else. Miss Billings left the employ of the State of Massachusetts in April, 1919, with the result that after-care work in this State at present is not in an altogether satisfactory condition.

The experience of Massachusetts in this work is one which should teach valuable lessons to any other community about to undertake it. In the first place, it must be looked upon as a vital and fundamental part of any antituberculosis campaign. The private physician or dispensary must not regard the work done, and well done, as soon as this or that patient is safely within the walls of any sanatorium; the dispensary nurse should in every case go to the institution and visit the patient, cheer him up, report to him as to conditions at home, and persuade him to stay as long as is necessary in the sanatorium. Some one, nurse or physician, should visit the patient's home and see that every child is examined, and adults when necessary. The Sanatorium authorities in turn ought not to lose all interest in the patient as soon as he is discharged. The patient should be urged to visit his family physician or the local dispensary at frequent intervals, and to return to the sanatorium for examination occasionally. An excellent custom in the Massachusetts Sanatoria of discharging a patient "on parole" might well be followed elsewhere. This means that a patient whose conduct while at the sanatorium has been such as to merit it is discharged "on parole," and is allowed the privilege of readmittance to the sanatorium at once should this be necessary, without having to wait his turn upon the waiting list, which might cause a delay of months. Above all, in this after-care work it should be borne in mind that the human and personal element must never be lost sight of. Nurses, whether under local or state control, must realize that they are not dealing with this or that case of consumption in the first, second, or

third stage with the disease quiescent or arrested, but that they are dealing with men, women and children fighting for their lives. Unless this is remembered at all times, after-care work will not be a success.

Opposition on the part of patients and their families is rare. Opposition on the part of the patient's physicians who sometimes feel that their own functions are being taken over by a nurse is not uncommon, but this is fast disappearing. Opposition, or rather failure to coöperate, on the part of certain local boards of health and dispensaries will constantly be met and must be handled with patience and tact or firmness and more vigorous measures, as the case may be.

The important point to remember in regard to after-care work is that patients are almost never cured and very rarely permanently arrested by a few months of treatment at any sanatorium, and that to make the money spent in their behalf by private individuals, private organizations, or by the state, a really sound investment, after-care work, based in a general way upon the lines here mentioned, is essential.

A plan for after-care work for a state would be somewhat as follows:

At each large sanatorium and at each hospital for consumptives there should be a social worker whose duty it is to become acquainted with the patients, their friends and relatives, and especially with those who are about to leave or at least who declare their intention of doing so, or are showing signs of becoming restless. Certain of these patients she may be able to persuade to remain in the institution as long as the physician feels that they should, but her great field of usefulness will be in connection with those patients who are ready and in proper condition to leave, and perhaps to resume their occupation outside. In such cases as these, either by letter or whenever possible by personal visit, this

social worker or nurse should get in touch with the patient's family physician, employer, and friends, and should collect detailed information as to the exact situation in his home. In many instances, as I said before, in the isolated country districts she will be the only one to do this work, but as local tuberculosis dispensaries increase and the nurses connected with such dispensaries become more active and efficient, more and more of her work can be turned over to the local nurse or social worker. These local nurses should be encouraged to visit the sanatoria and the patients from their localities who are inmates of the institution. This will not only cheer and encourage the patient and his family at home, but will be a potent force in educating the nurse, broadening her vision and obtaining her coöperation. Those patients who are supervised in their homes and who do not go to a sanatorium, of course, must be under the care and supervision of the local nurse under the local dispensary. Those who in Massachusetts are called "state cases" which comprise that group which ought to be very small, and which, unfortunately, is a fairly large one at present at least, of patients who do not seem to have any definite home, and who drift from one place to another so that no board of health or dispensary assumes definite charge over them, may have to be supervised in a slightly different way by nurses employed by the State Department of Health. These two latter classes, however, the patients who do not go to a sanatorium and the state cases without any local settlement, strictly speaking do not come under the class of discharged sanatorium patients; nevertheless all three groups are handled practically in the same way.

A nurse who actually lives in a sanatorium or at least has her headquarters there, knowing the physicians, and getting to know the patients well, can do vastly better work in han-

dling the discharged sanatorium patients than any group of nurses acting under a state department of health or any other state executive department. No matter how conscientious such nurses may be, every new patient is bound to be a stranger, and the personal, human touch will be practically missing. The time is rapidly coming when no sanatorium can be said to be a complete and up-to-date institution unless it is equipped with a social worker or nurse living at the institution who can perform the duties above described. She cannot, of course, do all the work herself, but she can and will gradually obtain the closest coöperation with local agencies, thus multiplying her usefulness without losing the personal and human touch.

CHAPTER VII.

TUBERCULOSIS AND DISPENSARIES.

UNTIL recently, one of the chief aims of the antituberculosis campaign has been to establish sanatoria for early cases and hospitals for advanced cases. We have centered all our efforts in this direction, and the public and the medical profession as well have associated in their minds the word "tuberculosis" with the word "sanatorium." It is becoming more and more evident, however, that the time that a patient spends at a tuberculosis sanatorium or hospital in the great majority of instances is only one factor in the successful treatment of his case. Even when the patient dies, his problem still remains, for his family and children must still be cared for. To make the sanatorium treatment effective, therefore, and to make the time, strength and money spent on these patients a good investment, we must add to our equipment in fighting tuberculosis something that will help us to discover the consumptive when still in the early and curable stage, that will help him to carry out the methods of living necessary to his future welfare after he has left a sanatorium, and finally that will look after his family and see that it is provided for while he is away from home. This "something" is the tuberculosis dispensary. The time has come when we must regard the tuberculosis dispensary as an essential and necessary part of our machinery to combat consumption.

The chief objects of tuberculosis dispensaries are two-

fold: (1) the discovery of the consumptive at a time when he can be cured which means early diagnosis; (2) the supervision and care of the consumptive so that he will stay cured. The futility of spending money, whether it comes from the state or from private sources, on an investment which is not a permanent or sound one, is manifest. The tuberculosis dispensary helps in the accomplishment of these two objects and is an important factor in making the immense sums now spent every year in combating tuberculosis a sound investment. Although the standard of work done by the general practitioner in diagnosing and handling the individual cases of consumption is slowly but surely improving, this huge task cannot be handled adequately by him alone. Many patients who are in need of treatment and advice are prevented from obtaining either by financial reasons. For such patients, and they form the vast majority, the tuberculosis dispensary is the only place to which they can apply for advice and help.

The question of establishing dispensaries has been solved in many different ways. In large cities they are often a part of the out-patient department of a general hospital. While the results thus obtained, as far as diagnosis is concerned, may be satisfactory, that part of the work which is fully as important, consisting in the supervision of the patient, following him up after his return from a sanatorium, investigating his home conditions, etc., is usually done superficially, or not at all, under such an arrangement. It is only fair to say, however, that the development of social service departments in our general hospitals is rapidly changing things for the better as far as the handling of tuberculosis in our out-patient departments and dispensaries is concerned.

In the year 1910, the State of Massachusetts passed a law requiring all cities and towns with a population of 10,000 or more to maintain a dispensary for the detection and treat-

ment of tuberculosis. There were no set standards for such dispensaries, nor indeed was the law enforced until the year 1915, when a new health department took the matter up and pushed it through vigorously. Many of the dispensaries in this state were already in existence prior to the passage of this law, having been originally founded by some private organization, usually the local antituberculosis society. Some of them were connected with local tuberculosis hospitals, some with general hospitals, while others were independent units. They are now all under the direct control and supervision of their local boards of health and are efficient or inefficient, according to the quality and standards of the local health board. In Massachusetts, and this should be the case everywhere, they are under general supervision of the State Department of Health. In many cases individual circumstances must decide whether or not a dispensary can best be managed by the local board of health or the local tuberculosis association or by a combination of both. A dispensary under the immediate control of a local board of health is liable to become contaminated with politics and thereby lose its efficiency. If salaries are paid the physicians, they are apt to be small, so that they do not attract high-grade men. On the other hand, through this connection with the local board of health and thus with the state health department, such dispensaries may have more authority and influence than those managed by private organizations.

Tuberculosis dispensaries should do more than merely provide opportunity for diagnosis and treatment; they should be centers of activity for all antituberculosis work. Each dispensary should serve as a general information bureau for tuberculosis. The first requisite is a nurse or social worker, or, as she may be called, an instructive nurse. Without such a nurse the dispensary has little value. The nurse should

have some training in social service work as well as in nursing. She must be forceful, tactful, and, if possible, should have an abundant supply of common sense.

The location should be central, easily accessible, particularly to the poorer parts of the community. This is of the greatest importance. The hours and days at which it is open depends upon the population of the community. In most instances, it is advisable to have an evening clinic for men and women who cannot get off during the day. There should also be certain days for children. There must be accurate records; there should be a general card index of all cases reported to the dispensary, and there should be a map in which cases in the community can be clearly indicated so that the number of patients and the location of each can be seen at a glance. Patients come to a dispensary through the following agencies:

1. The local antituberculosis society.
2. Physicians.
3. The school physician and school nurses.
4. Charitable relief organizations.
5. The family and friends of tuberculous patients.
6. Tuberculosis hospitals and sanatoria.
7. Personal applicants.

It is usually necessary to educate the medical profession in regard to the scope and usefulness of such dispensaries. In many instances physicians are liable to look upon them as infringements on their own rights, feeling that because of them their practice will be injured. It is essential to eradicate this feeling on the part of the doctors. They must be made to feel that their patients will not be taken away from them but that, on the other hand, the dispensary through its nurse will offer the fullest coöperation and will carry out the doctors' orders in every detail. The utmost tact and patience must

be used. The close coöperation of the school physicians and nurses is essential. The help and interest of labor organizations and of church and clergy should be obtained.

The dispensary by means of its instructive nurse must follow up each patient. Dr. Walter G. Phippen of Salem, Massachusetts, emphasizes the following as some of the things a well run tuberculosis dispensary should do:

1. Investigate the patient's home and living conditions, and recommend needed changes.

2. Interview his employer.

3. Provide an outfit for the patient to go to a sanatorium.

4. Provide temporary means of treatment and aid while awaiting admittance to an institution.

5. Provide additional food, such as milk and eggs, when needed.

6. Obtain the dependent mother's pension, if necessary.

7. Secure permanent relief for the family.

8. Bring the family to the dispensary for examination.

9. Arrange for treatment of other illnesses found in the course of these examinations, such as diseased tonsils and adenoids, carious teeth, etc.

10. Obtain the proper orthopedic care for the bone and joint cases, such as splints, dressings, and other apparatus.

11. Secure proper employment for incipient and arrested cases. This requires also the coöperation of the medical director, who should be the final judge of the fitness of the work.

12. To answer, through the nurse, the innumerable questions from patients, friends of patients, officials, organizations, ministers and social workers. The amount of help, advice and encouragement that the nurse can give is limited only by her time and ingenuity.

In large communities, one dispensary will not suffice. In

large cities there should be some carefully thought out plan according to which each of the various dispensaries is assigned to a definite district. Otherwise useless duplication will result. In New York City there are numerous dispensaries and clinics, each of which is assigned to a certain area for which it assumes the responsibility for the treatment and supervision of the cases living therein. These clinics arrange for a physician to visit and treat in their homes those patients that are too ill to attend, and for whom hospital care cannot be provided. Special children's clinics have been established. As a rule all patients who attend regularly are examined once a month, and the home of every patient is likewise visited at least once a month. The regulations require 1 nurse for every 100 patients; the number of physicians in attendance must be sufficient to allow for at least fifteen minutes for the examination of every new case, exclusive of the time given for history-taking.

The State of Pennsylvania has made this problem of dispensaries a state matter and has not left it to local authorities. This arrangement is certainly advantageous in that there is direct communication between the state sanatoria on the one hand and the state dispensaries on the other, but such a plan has, however, certain manifest disadvantages.

The following are the minimum requirements for tuberculosis dispensaries as defined by the Massachusetts Department of Health:

1. *Control and Maintenance.*—The tuberculosis dispensary shall be under the direct control of and financed through the following (in order of preference):

- (a) The local board of health.
- (b) The local tuberculosis hospital.
- (c) The local general hospital's out-patient department.
- (d) The local antituberculosis association.

2. *Supervision*.—The State Department of Health shall have supervision over all tuberculosis dispensaries, through its District Health Officers, as follows: “the state inspectors of health (district health officers) shall annually make such examination of . . . dispensaries, both public and private, caring for diseases dangerous to the public health, as in the opinion of the state board (department) of health may be necessary, and report as to the conditions and needs of such . . . dispensaries, to those responsible for the management of the said institutions.

3. *Rooms*.—The dispensary shall have at least two outside rooms:

(a) Anteroom or waiting room. (This may be used in common with other dispensary departments).

(b) Examining room. (This room must be reasonably quiet).

The rooms of the dispensary shall be well lighted during the day without the aid of artificial light, shall be heated comfortably in cold weather, and shall be kept in a clean and sanitary condition at all times.

4. *Equipment*.—Each dispensary shall be furnished with:

(a) A pair of accurate scales.

(b) A desk or filing cabinet for records.

(c) Record blanks.

(d) Examining stools and couch or table.

(e) Clinical thermometers.

(f) Running water and adequate toilet facilities.

(g) Facilities for receiving and transmitting to a laboratory sputum specimens and a supply of sputum containers for distribution.

(h) Accessories such as: Paper napkins, sputum cups, etc.; leaflets of direction and advice; diet lists, etc.

5. *Service*.—All tuberculosis dispensaries shall be open for at least one hour on one day, and on one evening per week. Days and hours shall be determined by the local authorities as seems best to fit local needs.

6. *Staff*.—Each dispensary shall have appointed at least one physician and one nurse, or otherwise qualified tuberculosis worker, both of whom shall be in constant, regular attendance. The qualifications of physicians, nurses and tuberculosis workers so appointed must be approved by the State Department of Health.

A properly run dispensary is a place where patients may learn the fundamental principles of caring for themselves and protecting others, while it also should serve as postgraduate or "continuation school" for the patient returning from a sanatorium. Such is the value of the dispensary in the anti-tuberculosis campaign that while in former times the standard of efficiency of antituberculosis work in any given community could be judged by the number of beds provided for consumptives in sanatoria and hospitals, now the standard of efficiency might be more correctly judged by the number and excellence of its tuberculosis dispensaries.

CHAPTER VIII.

TUBERCULOSIS AND THE NURSE.

THERE is no more important part of the work now done by the nursing profession than that which deals with tuberculosis and the various problems connected with it. Of all the special branches of her profession that a nurse may elect, there is none giving greater opportunity for real helpfulness than this, there is none that brings the nurse closer to human nature or gives her more definite and tangible return for the time and energy expended. In addition to this, in terms of dollars and cents, a nurse who specializes in this branch of her profession, and who by her training possesses special knowledge of her subject, may expect and demand a salary distinctly above the average.

The field of tuberculosis nursing is a varied one. First there is the care of private patients in their homes as carried on at health resorts such as Saranac, Asheville, Colorado Springs, etc. Next there is nursing in tuberculosis hospitals and sanatoria. This line of work, already large, is constantly increasing, so that at present the demand is greater than the supply. Third, there is public health nursing, where the nurse working under the direction and supervision of a local or state health department, or connected with a hospital or dispensary, private or municipal, visits the patients in their homes. Such nurses, often called "instructive nurses," I have already referred to in earlier chapters; I will here go into more detail as to the nature of their work.

THE TRAINING OF THE TUBERCULOSIS NURSE.

At the present time it is not an easy matter for a woman who wishes to go into public health tuberculosis nursing to obtain the necessary training without taking a fairly long course in addition to the years she has already spent. There is comparatively little opportunity for a nurse to secure special training in tuberculosis during her regular course. Nurses are given instruction in obstetrics, and in acute conditions in medicine and surgery, but they are taught practically nothing in regard to tuberculosis, one of the commonest diseases of modern times. This, however, is not surprising in view of the fact that the average medical student graduates and receives his degree from our leading medical schools with only a cursory knowledge of the general subject of tuberculosis. At the present time a serious effort is being made to secure affiliations between the general hospital training schools for nursing and various institutions for tuberculosis, in order that nurses at training schools in our general hospitals may have the experience of caring for tuberculous patients. It is to be hoped that some such arrangement as this, for which there is increasing demand, will soon be made. When this does occur, it will, of course, be necessary to employ as instructors nurses who have knowledge of this subject, which in turn will provide further opportunities for nurses wishing to take up this work. All graduate nurses who expect to take up tuberculosis nursing should have a few months experience in a tuberculosis sanatorium or hospital. Those who plan to enter the field of tuberculosis follow-up work should have an additional course in public health nursing which includes attendance at tuberculosis clinics and supervised home visiting of tuberculosis

patients. This preparation should give the nurse a working knowledge of the treatment of the consumptive both within and without an institution.

INSTITUTIONAL NURSING.

In our hospitals and sanatoria for consumptives there is urgent need for nurses trained in tuberculosis to act as supervisory nurses and superintendents. Many nurses who have had tuberculosis and who have become arrested cases, and who cannot possibly engage in general work again nor stand the hard routine of a general hospital, have been able to lead useful, happy, and self-supporting lives as head nurses or supervisors in local, county or state sanatoria for consumptives. I could name a fairly long list of my own private patients among nurses whose problem in life has been successfully solved in this way. The question of reinfection, the fear that the nurse may get tuberculosis, or, already tuberculous, may get more on account of living in close contact with consumptive, may be dismissed at once and without further discussion. *There is no such danger.*

Another opportunity for institutional work in tuberculosis is offered by the "preventoria" now being established in constantly increasing numbers, where delicate children may be sent for rest and treatment. Nurses are usually engaged as superintendents of these institutions, and especially those who know something of tuberculosis.

Finally, a most important field in tuberculosis in institutions consists in social service work in large sanatoria and hospitals. One of the great problems in institutions for the tuberculous is to keep the patient contented. A properly qualified nurse is the best means at our disposal for doing

this. In every large sanatorium there should be one nurse who is responsible for the following:

(a) She helps the patient to become adjusted to sanatorium or hospital life. The first two or three weeks are always the hardest for the patient coming from home to new and strange surroundings. If this trying period can be tided over by sympathy and tact, the chances that the patient will remain a proper length of time are greatly increased.

(b) She tries as far as possible to relieve the patient of family worries.

(c) She notifies local health and nursing agencies at least a week before the patient's discharge, so that the home is in readiness for the patient's return to it.

Many a patient leaves the sanatorium in the first month after admission because during that period there was no one to help and encourage him to stay; others, though they remain, are discontented and fail to gain because of financial reasons, or because they have failed to grasp the reason why they were sent there and what they are supposed to do while there; or, and this is a most vital point with foreign-born patients, because the food is new and prepared in ways strange and distasteful to them, or, again, because of family problems at home. These and other problems can be met and overcome by the social service nurse in the institution, working in close coöperation with the superintendent and with the patient's local physician, board of health, tuberculosis association, and other home relief agencies.

THE FIELD FOR THE PUBLIC HEALTH NURSE IN TUBERCULOSIS NURSING.

Public health nurses are employed to do tuberculosis nursing by the following agencies:

- (a) State departments of health.
- (b) County hospitals for county follow-up work.
- (c) Local boards of health.
- (d) State and local tuberculosis associations.
- (e) Public health nursing associations.

Tuberculosis nursing as carried on by State health departments is usually confined to developing new fields in tuberculosis nursing, supervising and improving that already being carried on, and in doing intensive follow-up work in the smaller communities, until local nursing agencies can be developed to assume it. This form of tuberculosis nursing needs women who have had not only training and experience in this direction, but those who have executive ability and who are capable of making and carrying out plans on a state-wide basis.

The county tuberculosis nurse usually works under the immediate supervision of the superintendent of the county hospital, if there is one, although the ultimate authority directing her work and that of other county nurses is usually the State department of health. The work of the county tuberculosis nurse often covers a large area. Her duties are primarily to follow up patients in the more remote sections of the county where there are no public health nurses. She is also expected to prepare the way for tuberculosis clinics to be held in the rural districts. This latter work, although almost non-existent in Massachusetts, is proving to be of great value in many other states.

Local boards of health in the larger cities and towns employ nurses usually in connection with local dispensaries to do intensive tuberculosis nursing, to assist at the tuberculosis clinics, and to carry on a campaign of education. This educational work, formerly in the hands of physicians, is now to a very great extent left to the nurse.

State and local tuberculosis associations frequently employ nurses to act as executive secretaries, or to engage in clinic and follow-up nursing until local authorities, whether of counties, cities or towns, finally take over the work. Nurses so employed, as part of their duties may be asked to gather statistics to demonstrate the need of additional nursing facilities and clinics, open air schools, or preventoria; or to assist in the development of industrial nursing, or to help introduce into the schools modern health movements, such as "Modern Health Crusade," and, in general, to arouse popular interest.

In the rural sections the public health nurse is engaged in generalized public health nursing, and is thus in a position to find hitherto undiscovered cases of tuberculosis. She is thrown in intimate contact with all physicians and townspeople, and should be regarded as a friend and adviser by families needing help. These nurses care for prentaal cases, for children below school age, as well as for school children themselves. In their prenatal work, they may find that the expectant mother is an arrested case of tuberculosis. Good nursing care before, during, and after her confinement may thus prevent her breaking down again. In her care of young children, the nurse may find that the father is a suspicious case of tuberculosis. Because he knows and believes in the nurse, he will often do what he would not do for anyone else, and visit his physician or the dispensary for examination and advice.

School nursing frequently brings to the attention of the physician the child of tuberculous parents. These children are especially in need of careful supervision and sound advice to keep them well. In these remote districts the nurse may find a child with bone or joint tuberculosis who is under no medical supervision whatever, and after a conference with the local physician she can arrange for a regular trip to the

nearest city for special treatment. The always overworked family physician should not be obliged to take time—and indeed cannot take time—to give detailed instructions to all his patients regarding treatment, precautions, making arrangements for institutional care, and the referring of the patient or the family to the proper agency for help when necessary. These and many other details the public health nurse is able to attend to, and can take off his shoulders. The nurse as a disinterested party can always advise that the other members of the family, particularly children, go to their physician for examination in cases where this same advice coming from the physician himself might be misunderstood.

Tuberculous patients returning home after their discharge from a sanatorium with their disease “arrested” frequently, or rather usually, believe that there is no further need for the advice of a physician. The tuberculosis nurse who knew the patient previous to his going away or who herself, perhaps, made the arrangements for his admission to the sanatorium, is in a position to impress upon the patient the need of regular visits to his family physician.

DETAILS OF PUBLIC HEALTH NURSING IN TUBERCULOSIS.

Upon entering a new community, the public health nurse should study not only the city or town, but the state as well. She should know the resources of state and community, such as laws relating to tuberculosis, State sanatoria, State hospitals, local hospitals and available clinics. She should be on friendly terms with the district health officer and the State supervising nurse, because frequently a friendly relationship on her part with the local board of health of the town in which she is working can be gained only with the

help of the district health officer. She should also know the secretaries of the state and county tuberculosis associations. She should visit the representatives of local health agencies such as the board of health agent and members of the board; she should cultivate the acquaintance of all physicians and if possible, all public health nurses in town who may be engaged in other forms of public health nursing, secretaries of the various charitable organizations, and others interested in tuberculosis work. She should get a record of all reported cases of tuberculosis from the State Health Department, and should compare this with that of the local board of health. In smaller communities where follow-up work has never been established, it is an excellent plan for her to take to each physician the list of names of those patients reported by him, as she can thus obtain from him valuable information regarding patients who have become arrested cases, or who have moved away, died, etc.

In large cities it is, of course, impossible for the nurse to visit all physicians, but it is well worth while for the supervising nurse to become acquainted with all physicians who are especially interested in tuberculosis work. In each district the local tuberculosis nurse should occasionally confer with the physicians who are in close contact with large numbers of tuberculous patients, and should ask for their advice and coöperation. In the small cities and towns, the public health nurse should visit all physicians, and if the work is new to them, it should be explained in detail, exactly what she is trying to do. She should volunteer her services to each physician, and offer to follow out any special suggestions regarding his patients. If the orders of each physician are carried out as carefully as possible, and occasional reports are sent to him regarding the patient's progress, there will be no real difficulty or misunderstanding with the physicians.

The attitude of the nurse should be that of helpfulness. She should offer to report to the local boards of health findings relating to the tuberculous patients whom she visits. It often happens that the books of the boards of health have never been checked up, and no data is available therein regarding patients who have moved, women who have married, with consequent change of name, and patients who are well and working, etc. The authorities will welcome this and other information. When patients are recommended by the physician for sanatorium or hospital treatment, the nurse should confer with the physician and the proper authorities; together they should work out a plan for both the patient and family, which in many cases would include both institutional care for the patient and material relief for the family.

Local charitable institutions likewise must not be neglected or slighted. A better understanding with them will be reached if the nurse refers to them all the needy families of tuberculous patients. The nurse who assumes the duties of these organizations is bound to be misunderstood. In the smaller communities, where there are no such charitable agencies, it is much better for the nurse to try to organize a small committee to care for the relief giving, rather than becoming a purveyor of food, clothing, etc., herself.

This close coöperation between the medical profession, boards of health, charitable agencies, and the nurse is of fundamental importance in order to do good and efficient work.

The care of the tuberculous patient includes not only the patient himself but his family. The first visit to such a patient should be made only after a conference with the attending physician, and as soon as possible after the diagnosis has been made. This is liable to be the psychological

moment when the patient, usually very much depressed, is willing to take whatever measures the physician and nurse think best for his recovery. It has been found that at this first visit it is usually perfectly feasible to take the greater part of the required history, but it is essential that the patient should understand clearly that the nurse is visiting him to help him recover, and not to gather statistics. After a nurse gains a little experience in history taking, the greater part can be brought out during the conversation with the patient and written out afterward. A kindly and sympathetic attitude is essential. Patients who feel that the nurse is sympathetic will be far more liable to tell her all the things that worry them, in order to gain her help and advice. At this time emphasis should be laid on the special treatment that the family physician has advised. Perhaps he has advised the patient to go to a sanatorium. It remains for the nurse to outline sanatorium treatment, to explain to the family and to the patient where the particular institution is located, what it looks like, and that the superintendent and doctors in charge are authorities on tuberculosis. The patient might well be told of others, friends of his or those who live near by, who have been treated at that particular institution, and who have now recovered and are back at work. Finally, after the patient decides that the institution is the place for him, and an application has been placed on file, the nurse must see to it that arrangements for his treatment at home pending his admission to the sanatorium are made.

HOME TREATMENT.

It is always advisable to select one person in the family in addition to the patient who will take a special interest in the treatment of the patient and the precautions to be observed.

The question of sleeping quarters is always an important one. More often than not in the poorer sections of a city, the patient has been sleeping with at least one other person. The nurse will be invited in to see the sleeping room, and should then try and help the family make plans to have the patient provided with at least a separate bed and, if possible, a separate room. Carpets and unnecessary hangings and furniture should be removed. The nurse should leave instructions regarding the number of hours which should be spent in bed. Directions should also be given regarding open windows. Many times the nurse will need to explain with great care to both the patient and the family the need for fresh air and the fact that it will not injure the patient, but do him good. Occasionally there will be a small porch, sheltered from the storms, where with little expense the patient may be made quite comfortable.

The nurse should take up the questions of food, the kind and the need of eating regularly, and the important details concerning rest or exercise with both the patient and the family, explaining the details the physician wishes carried out. Then she should give advice relating to care of sputum, precautions to be observed while coughing, the boiling of dishes, bed linen, towels, napkins, use and care of tooth brush, and how to obtain proper dentistry, if needed, bathing and care of the bowels. The nurse should be certain that sputum boxes or paper napkins are provided for all patients who need them. It is not enough to emphasize these details of treatment the first time only. At all subsequent visits inquiries regarding routine treatment and precautions should be made, and the need of paying strict attention to details at all times impressed upon the patient and the family.

After the patient enters a sanatorium or hospital, the

nurse's task is not finished. The care of the family must go on. The home must be kept as cheerful and normal as possible, so that encouraging reports of the health and well-being of the members of the family may be sent regularly to the patient. This will tend to keep him happy and contented, and will thus help in his recovery. It is well worth while to try and lift the family standard of living while the patient is away, so that after his discharge from the sanatorium it will not mean a return to the same unwholesome surroundings that may have existed before. After he returns from the institution with his disease arrested or improved, there is always a question of continuing a proper mode of living at home. Every ex-patient should be urged to visit a physician for regular medical examination. It is often necessary to assist them to find the right kind of work. Frequently, manufacturers who have previously employed these patients will be ready to assist by reëmploying them on a part-time basis until regular work can be assumed. It is always well to assure the manufacturers that the patients who are being recommended for work are under the care of a physician and are being visited by the nurse. The manufacturers should also be assured that if the patient develops active tuberculosis at any time, he will give up work. When employers appreciate the fact that these patients are being closely watched, so that there is no danger to others in their employ, they are usually willing to give the best of coöperation.

Not every consumptives gets well, or even improves. There will always be the problem of the advanced consumptive who returns from an institution and who must be cared for at home until the end. In these cases, if advice regarding his going to a hospital is of no avail, the only thing left is to try and make the patient as comfortable as possible at home.

In these cases remember the important thing is to prevent the spread of this disease to others, especially the children. These must be protected at all hazards. If possible, provision should be made for the care of these children outside the home until the patient recovers or dies. In every case where there is an adult consumptive it should be a routine measure to see that every child is given a thorough examination and kept under supervision. For it is these children who will be the consumptives of the next generation, unless something is done to prevent it.

Help in the way of food, clothing, or money is often needed by the family of the tuberculous patient. Except on very rare occasions, this aid should *not* be administered by the nurse. The family should be referred to a relief-giving agency, and a plan worked out between the nurse and the agency which will meet the need of the family.

The members of a family exposed closely to tuberculosis should be examined, particularly the children. It is advisable to take up with the family physician the question of where this examination should be made. Occasionally the physician will suggest that the examination be made by him in his office, but frequently he will urge that this be done at the nearest dispensary, and will ask the nurse to attend to the details and to let him know the results. It often happens that many of these so-called "contact cases" refuse to be examined at a dispensary. Whether or not this obstacle can be overcome depends upon the standing of the dispensary in the community, and the ability of the nurse to urge the necessity of such examination in an appealing way. When families of these sick patients learn to know the nurse and believe in her, they will usually follow her advice. This has been evident from the large attendance at such clinics where both examining physician and nurse are respected and liked.

WORKING HOURS.

The public health nurse in state and county tuberculosis nursing often finds that her working days are frequently ten or more hours in length. This is because of the difficulties of transportation, likewise because she is often called upon to give evening talks and lectures in addition to her other duties. During tuberculosis surveys, the hours are most irregular, as many patients are working and the nurse is obliged to visit them in the evening, in order to obtain the information she requires. In the cities, the hours are more regular, the exceptions being evening clinics and occasional evening visits to patients who are working.

In spite of this, however, tuberculosis nursing is not so hard on the public health nurse as general district nursing. There is less bedside nursing, no emergency work such as preparation for surgical operations in the homes of patients, assisting the surgeon and remaining with a patient until a private nurse can be secured. In the remote rural sections of a state, the public health nurse doing generalized nursing is frequently called upon to help in these and other ways. Nurses who have had training in public health, therefore, but who cannot maintain their health in general public health nursing, will do well to consider tuberculosis nursing. There is certainly no field more in need of the best type of trained nurse, and none more interesting to the nurse who believes in her work.

SALARIES.

The salaries of the tuberculosis nurse vary according to amount of experience she has had and her ability to organize and develop tuberculosis work. The average nurse in public health tuberculosis nursing is started at a salary of from

\$1200 to \$1500 per year, which in cities is increased to \$1500 and \$1800. Nurses are frequently employed as executive secretaries where they are not only in charge of the tuberculosis work carried on by the association, but also have charge of money-raising campaigns, Christmas seal sales, etc. Salaries in such positions vary from \$2000 to \$3000 a year, and average quite as well as the salaries of supervisory nurses in other fields.

RECORDS AND RECORD KEEPING.

Record keeping is most important. It should give as clear picture as possible of the patient and his family. After a record form has been decided upon, the nurse should write out briefly and clearly a statement regarding the patient and the home conditions as found after each visit. Many times nurses feel that they are too busy with the many details of follow-up work to take the time to keep good records. This is a mistake, as the record keeping, in addition to its value to the health officer, physician, and others, is a proof of the really good work which the nurse has accomplished. In cities and towns where the nurse is obliged to write all her own records, it is most important that the form be a simple one. It is better to have simple records carefully kept than elaborate records with little on them. In addition to the history card for the patient and family, nurses engaged in State or County work will find it valuable to have a cross-reference card filed according to cities and towns. By this means, the number of patients under supervision in each given locality can be easily determined. Both the city nurse and the rural nurse should have a cross-reference index card filed—in the case of cities—by streets, and in the country by villages. If the nurse is obliged to be away from the office

for a period of days, so that some time elapses before she can record her visits on her history cards, it is well to have a duplicate of the history card printed on loose leaves to fit in a small compact loose leaf record book. Her histories can thus be written up each day, and at the end of the week copied on her regular history cards. In this way there will be no loss of valuable information.

Her records should show:

(a) The section in the city or town where there is the greatest number of cases of tuberculosis.

(b) The relation of the number of living cases to the number of deaths from tuberculosis.

(c) As months or years go by, improvement or lack of improvement noted in each patient and his family.

(d) Whether or not the patient has been under adequate medical supervision.

From these records the public health nurse is frequently able to determine whether the lack of improvement of the patient may not have been due in a measure to the fact that the home visits were too infrequent, and that the quality of supervision was inferior, and other important information. The tuberculosis nurse, however, should never become a mere seeker after statistics at the expense of the welfare of the patient or family. She should always remember that each patient whom she visits may have an opportunity to recover if given helpful advice and information, providing means for adequate treatment are available; also, that while every one in the family should be examined, they will not develop tuberculosis, if properly cared for and taught how to avoid it, and finally, that she is often the one person who is in a position to bring together patient, physician, board of health agent, private tuberculosis agency, and charity organization worker, and that by means of such concerted action, death and sickness may be prevented.

TUBERCULOSIS SURVEYS.

A "tuberculosis survey" is the name given to a comparatively modern method of "medical stock-taking." It is an attempt to find out *exactly* how many cases of tuberculosis exist in a given community, with every detail as to the number of deaths, ambulatory cases, bed cases, distribution of cases, etc.

Tuberculosis nurses are usually placed in charge of the detail work necessary in making such surveys. Occasionally, definite instructions regarding this work are given, but such instances are rare. If no such detailed plans are given to the nurse, she should collect information as follows:

(a) Records from City or Town Clerk, including the number of deaths from all forms of tuberculosis covering a period of at least the past three years.

(b) Records from State and local Boards of Health, including all reported cases of tuberculosis since the disease became reportable.

(c) Records from State and local hospitals where tuberculous patients from that district included in the survey are cared for.

(d) Records from the local dispensary.

(e) Records from the State and local tuberculosis association or other organization.

(f) Records from charitable organizations caring for families of tuberculous patients.

This information should be tabulated on cards (preferably 4 inches by 6 inches in size) arranged alphabetically by name. The cards should be filed according to streets, and then arranged by wards in the cities, or by villages in the county.

CLINICS.

If, in connection with the survey, special tuberculosis clinics are to be held, the dates for these should be decided upon before home visiting is commenced. These dates should be strictly adhered to, as it is manifestly impossible to notify each person of a change in the date of clinics, and there is nothing more damaging to the success of the clinics than frequent changes.

The nurses engaged in home visiting should be instructed to visit all such recorded cases of tuberculosis, and should try to see that all suspected cases of tuberculosis and all others living in close contact with them, "contact cases," are examined. In addition to this, she should make constant inquiries regarding the possibility of unknown tuberculous patients living in each neighborhood. Such inquiries often produce unexpected results, such as the discovery of an advanced case of tuberculosis who hitherto had received no medical attention and had never been reported as having tuberculosis.

In addition to the home visiting, publicity is a great factor in bringing in possible and suspected cases of tuberculosis to the clinic for examination. It has been estimated that approximately 25 per cent of people examined in a series of special tuberculosis clinics came for examination because through newspapers, movies, or by signs and placards their attention was called to the fact that a tuberculosis survey was being made, and that free clinics with expert physicians in charge were being held at certain dates. Newspapers, moving picture theatres, etc., will usually give free publicity regarding such special clinics and the survey in general. Posters will draw attention to the time and place where

clinics are to be held. Pay envelope slips in the factory announcing the clinics are always helpful in influencing many of the foreign-born to attend them. In addition to these measures, there are many other ways of reaching the undiscovered case of tuberculosis. There is the selectman in the country district, who often knows all the people in the town, and the ward "boss" in the city, who wants to help his constituents. The secretaries of labor organizations are always ready to help distribute literature and put up posters relating to tuberculosis, and suggest visits to suspected cases. In the foreign section of a city or town, the local clergy are often in close touch with the sick, and will give every assistance. In these districts the local shopkeeper often knows where the sick person has moved, and many times these men will make every effort to help to locate suspicious cases and to bring them to the physician or the clinic for examination. Neighbors, too, will remember the man who coughs, and ask the nurse to call at his house. The nurse as a disinterested agent can often give advice to the family that the patient return to his physician and that those exposed to the disease be examined, which would not be heeded coming from any other source. The tuberculosis nurse should take the time to go not once but often if necessary, to try to persuade the "contact case" to visit a physician, and it is only in rare instances that her advice, if persisted in, will not be heeded. It is the exceptional person that will not listen to her in the end. The nurse who says that patients in her town refuse to see the family physician, or to attend the clinic, and are hopeless is usually unqualified for the work, and is herself to blame for her lack of success.

Tuberculosis surveys have made clear the following facts:

(a) That there are many undiagnosed cases of tuberculosis working at home or in the various industries, who are under

absolutely no medical supervision until shortly before their death.

(b) That there are many patients who, when examined by a physician and told that they have tuberculosis, do not return to the same physician, but wander about from one physician to another until they find one who says they do not have tuberculosis, but are merely run down, etc.

(c) That many patients do not go to a physician regularly because of lack of funds.

(d) That the majority of "contact cases," particularly children, are not examined.

The report of the findings from these surveys should, of course, be carefully prepared and submitted to the organization for whom the work was carried on, but above all things the nurse should use every means in her power to see that the information which she has labored so hard to collect is put before the general public in clear and readable form where it will really do good. The filing cabinets and record rooms of many associations are filled with valuable information collected at great expenditure of time, energy and money, which has never reached the public and thus has not fulfilled the function for which it was intended.

There has been no time during the past ten years when nurses qualified to do tuberculosis nursing in any of the ways described in this chapter have been in such demand. The salaries of these nurses are fully as good as those paid to nurses engaged in other forms of public health work. There is, in addition, a very real and inspiring work to be accomplished by the nurse who is fitted for the task.

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CHAPTER IX.

TUBERCULOSIS AND ITS RELATION TO SCHOOLS AND SCHOOL CHILDREN.

IT has already been shown how tuberculous infection takes place in the early years of childhood and that practically every child, by the time his fourteenth or fifteenth year has been reached, has already become infected with the germs of this disease. The importance of distinguishing between tuberculous infection and tuberculous disease has also been emphasized.

As a great part of the first fifteen years of every child's life, with the exception of the first three or four years, is spent at school, it can be readily seen that proper medical inspection and supervision of the child during these school years is a most important factor in the tuberculosis campaign.

In 1912, the late Dr. Arthur T. Cabot, of Boston, called attention to the responsibility of the State in this matter. "The State insists upon and enforces attendance at school during the growing years of the child, and in so doing, tacitly assumes the responsibility that the child does not suffer any harm by reason of this school attendance. It is, therefore, the duty of the community to safeguard the health of the school children as far as lies in its power." The State of Illinois has shown within a few years how great is the economic loss to the community in cases of school children with tuberculosis. It was demonstrated by this investigation that Illinois spent \$1,187,000 annually in educating

children who died of tuberculosis before reaching the twentieth year. From the point of view of dollars and cents alone, therefore, the question is a most important one.

Peter Frank of Austria first discussed the duties of physicians to schools at the beginning of the nineteenth century. In 1832 the number of lessons in the schools in Sweden was diminished for reasons of the children's health. Physical training of school children was urged in Boston in 1860. The first experiment of outdoor schools was made in Germany in 1904. These schools, "*wald schule*," were established in a suburb outside of Berlin, situated, as the name would indicate, in a forest. Arrangement was made with the transportation companies, whereby the children could go out to such schools in the morning and return to their homes at night at minimum rates.

The history of the open-air school in the United States dates from 1908. The first school of this sort was established in Providence, R. I., by Dr. Ellen R. Stone. To-day the open-air school movement embraces not only tuberculous children, but anemic and malnourished ones, and a very considerable number of normal children as well. If one were to include under this category all types of fresh-air classes and special rooms for these three groups of children, the total would no doubt run up to 3000 and possibly more. It is difficult to ascertain the total number of open-air schools and classes because of new ones springing up almost daily.

From this beginning in Germany in 1904, and in this country in 1908, the movement for outdoor schools for children, and not only for those children who were already sick, but to prevent well children from becoming sick, has become nation-wide.

In the outdoor school is found one of the cheapest, simplest and most efficient remedies for the care and prevention of

tuberculosis among children. Protection of the children in the homes of the poor in the crowded tenement districts is a difficult, if not impossible task, and yet it is among these children that the initial infection with tuberculosis takes place. In every house where there has been an advanced case of tuberculosis, an investigation will show that a large proportion of the children have already become infected with this disease. One remedy which has been suggested, namely, that of removing all of these children and placing them in separate institutions, is impracticable except in a few instances. Another remedy, and one far more feasible, consists of segregating the advanced consumptive and thus protecting the children. Although this is being done more and more every year now that public sentiment has been aroused almost to the point where it will not permit the careless, ignorant and perhaps incorrigible consumptive to mingle with impunity with the public, yet it will be many years before this source of infection can be entirely eliminated.

In the meantime, it remains for us to put the children under such conditions during the large proportion of each day that they are at school that they will become strong and healthy and able to throw off, overcome, or at least control the tuberculous infection that they are almost certain to receive at home. By this arrangement the home is left intact, which in itself is of inestimable advantage. The question of pauperizing the family does not enter into consideration, as open-air schools should be considered as an integral part of the public school system and in no way a public charity.

At the present time, public opinion has not yet reached the stage to demand that every school be made an open-air school, nor to insist that we do not wait, as we do at present, until the child becomes sickly and run down before we give

him the proper living and school conditions of which he is so urgently in need. Special attention, therefore, must be devoted for a considerable time to come to that group of children who are manifestly more in need of help in this way than the others.

School children may roughly be divided into three classes. The first comprises those who are manifestly well and strong. These children are at present, perhaps, the most neglected class. It is to be hoped that we will soon realize that it is better to keep these children well and strong even at considerable expense than to allow them to become sickly at a still greater expense. The second class consists of those children with open and frank pulmonary tuberculosis. These children do not form a school problem, but a hospital problem to be treated as such. They do not enter into consideration here. The third and largest class for which the open-air school is intended, consists of those children who undoubtedly have a tuberculous infection, but not tuberculous disease. These children are sometimes wrongly called "pre-tuberculous." They are liable to be anemic, run down, underweight and poorly nourished. They tire easily, have frequent colds, and are often considered unintelligent and lazy. The open-air school can produce remarkable results with this class of children.

It naturally follows that along with the open-air school movement, and intimately associated with it, there must be a proper system of medical inspection of school children. Such medical inspection is of more importance as far as it concerns measures for maintaining and increasing the health and working capacity of each pupil than that part of it concerned with the exclusion from the school of certain children sick with some contagious disease. Medical inspection must not be limited to this alone. There must be systematic

and thorough examination of all children, and especially those of tuberculous parentage, or those living in a home where there has been a known case of consumption.

The principles of the open-air school are those of personal hygiene, fresh air, cleanliness, proper clothing, proper diet, rest and recreation. No system of artificial ventilation which provides "baked air" can possibly take the place of the fresh, open air of such schools. In regard to the site, accessibility and hygienic environment are the two main points. As a general thing, if one must be sacrificed, accessibility may be sacrificed with better results, as the possible harm by the exhaustion of a long ride is more than offset by the benefits of the change of scene and open-air conditions outside of a large city. In many cases, however, the open-air school or the fresh air room must necessarily be in the midst of the city adjacent to or actually a part of a school building already built.

There are two types of buildings. In one the "open-air school" consists simply of a room in the main school building set aside for this purpose and either provided with specially constructed windows, or with the windows actually taken out so as to admit the maximum of fresh air. The other type consists of a separate building of simple "shack" construction. The children who should attend such a school can usually be found with the coöperation of the teacher, school physician, and the school nurse. The school nurse is an essential part of any outdoor school. Whether such a school should be run under the health department or the school department is a question which must be settled according to local conditions. In many instances, such a school has to be started by some volunteer society.

Ordinary clothing will do for part of the year, but when the cold weather sets in, heavy underwear and sweaters must

be provided. As the winter comes on, Eskimo suits, gloves, boots, etc., are essential. Such outfits can now be easily obtained, and need no special description. It is important to remember that the air, while it must be fresh, must not be too cold. It is generally agreed that the temperature should not be allowed to fall below 40° F. Extreme cold, just as extreme heat, saps the vitality and does harm rather than good. It is extremely important to bear this in mind; in New England and in most of the northern states, some method of heating the room in extremely cold weather is essential.

A typical program would be as follows:

Arrival, 8 to 8.30 A.M.

Putting on school clothing.

School work.

Light lunch.

Recess.

School work, or rest period for young children.

Dinner.

Rest for one hour.

School work for older children only.

Light lunch.

Dismissal, 4 to 5 P.M.

The lunches are essential, particularly as in the large cities, the children's breakfast is liable to be a minus quantity, as far as nourishment is concerned. Studies should be interrupted by exercises, folk dances, play, etc. The diet should be carefully supervised, and not too suddenly changed from what the child is accustomed to have at home. There should be thorough and periodic examinations by a doctor, while the school nurse should investigate the home conditions, and endeavor in every way possible to obtain the coöperation of the parents. Careful record should be kept of the weight

of each child. If a child's weight steadily drops despite proper food, clothing, rest, etc., it should be taken for granted that such a child is not suited for such vigorous treatment.

The cost of such schools, in comparison with the results obtained in increased strength and vitality, is not great. In terms of health there is no better investment. The results, not only in the increased physical welfare of the child, but in the amount of school work which the child is able to do, as compared with that which he was able to accomplish under the old system are remarkable.

Such schools should not only teach the children something about the prevention of disease, and how to maintain and preserve their health, but should also provide instruction to the parents at the same time. In obtaining the coöperation of the parents, here again the school nurse is an essential factor; especially in cities she can accomplish much more than the combined efforts of the school physician and the teacher.

As stated earlier in this chapter, the object of these schools is not so much to treat or cure tuberculosis, or tuberculous infection, as to prevent the development of tuberculosis in the future. Where one life may be saved by proper treatment, thousands may be saved by timely preventive measures. In Boston, according to the results of an investigation made a few years ago, out of 42,750 school children who had been examined, only 35 per cent were up to the standard known as "physical par," making 65 per cent defective, or suffering from some disease more or less serious. In a considerable proportion of cases, this disease was tuberculosis. This gives some idea of the size of this problem, and also suggests a certain criticism of our present method of school inspection. While the search for physical defects in the children is a necessary part of any school inspection, it should

be borne in mind that the desire and aim to develop perfect specimens of physical childhood, and, in later life, of manhood and womanhood, is the real object of any system of school inspection. As strikingly stated by F. B. Dressler in a bulletin of the United States Bureau of Education in 1912, referring to school inspectors: "The normal with many of them is the abnormal. It seems more than foolish to shut up our well children in unventilated and improperly lighted rooms, furnish them no playgrounds, compel them to live a life not in accord with the laws of physical development, and then when they become anemic, near-sighted and defective, make a great stir about special classes for defectives, and spend in building special schools money better spent in keeping children well. We must learn that it is far more important to furnish conditions which promote health and development of well children than it is to make special efforts to care for those who are sick or defective, especially where these defects have been largely induced through neglect. We need health officers whose chief delight is in finding and developing beautiful cases of physical perfection, rather than in finding some obscure and rare disease. We need doctors of health, who will be more delighted in exhibiting a long list of healthy, well-developed children than a long list of those who are physically defected and diseased."

These words, full of wisdom and of sound common sense, embody all that we are trying to do in preventing tuberculosis among school children.

CHAPTER X.

TUBERCULOSIS AND HOUSING.

TUBERCULOSIS is a "home and house disease." These words "home and house" have been used in connection with consumption and its development from time immemorial. Civilized people spend one-third of their lives indoors for sleep, and by far the greater number of all workers are engaged at indoor occupations. Therefore it follows that most of us virtually spend our lives indoors. This fact alone is sufficient to demonstrate the importance of proper housing, and shows how intimately the housing problem is connected with that of tuberculosis. As early as 1900, Dr. Herman M. Biggs wrote as follows on the relation of housing to tuberculosis:

"While tuberculosis in all countries has always been particularly prevalent among the laboring classes, its prevalence is greater in the centers of population, where the tenement house districts afford the conditions which especially tend to its development and extension. The density of population always bears a more or less constant ratio to the prevalence of this disease, the mortality increasing with an increasing density. . . . The lack of light, air and proper ventilation in the dwellings, combined with insufficient or improper food, and too often with dissipation among the inmates, induce the conditions in human beings under which tuberculosis develops most luxuriantly. The conditions found in the average New York tenement and lodging-house districts present all these objectionable features in a striking degree."

Again Dr. Biggs wrote: "Experimental investigations have shown clearly enough that the tubercle bacillus—the only necessary factor in the production of tuberculosis—is readily destroyed by sunlight, or even diffused daylight, and in this, as in all other communicable diseases, the danger of infection is largely diminished by thorough ventilation, because of its influence in diluting the infectious material. But in too many of the houses in New York City there is never sufficiently thorough cleaning to remove the infection, nor sufficient means of entry for sunlight, daylight and fresh air to enter and destroy the tubercle bacilli. Therefore, in the absence of radical measures for renovation or disinfection, there is every reason to expect that continued prevalence of tuberculosis among the occupants, and the permanent residence of the disease in a house when once it has been introduced, however, frequently the occupants of the house may change."

One of the most striking demonstrations of the relation between housing and tuberculosis was the pioneer work done by the New York City Department of Health in 1894 at the suggestion of Dr. Biggs, when a series of maps was prepared, showing by means of colored dots the undue prevalence of this disease in certain houses. These maps showed that on a single street block as many as 102 cases had been reported within a period of four and three-quarter years, and as many as 24 cases in a single house. In one block on the lower east side in New York, viz., that bounded by Cherry, Market, Catherine and Monroe Streets, with a population at that time of 3688⁹ people, there were 241 cases of tuberculosis.

Similar tables presented in Dr. Bigg's report show that at each age period, the phthisis death rate had similarly advanced in the overcrowded districts, *and that in the most*

overcrowded districts the mortality from phthisis was more than three times that obtaining in the less crowded districts.

How important this method of attack was in his mind as compared with the establishment of sanatoria and hospitals for the treatment of those sick with the disease is shown in the following significant statement which he made sixteen years ago:

"While I feel strongly the need of establishing state institutions and city institutions for the care of the incipient cases of tuberculosis in properly selected localities—the Adirondacks and elsewhere—I cannot but feel that this measure is of far less relative importance than those which look directly to the prevention of the disease by the establishment and enforcement of proper regulations.

"There has been a reduction in the mortality from tuberculous disease in New York City since 1886 of 35 per cent, and I have no hesitation in saying that I believe, with a complete and efficient scheme for dealing with pulmonary tuberculosis, including necessary improvements in the housing of the tenement house population, suitable hospital accommodations and the proper enforcement of precautionary measures, the death rate from tuberculous diseases in New York City may be further reduced one-third within a period of five years. This would mean the saving of 3000 lives annually. No other measures offer promise of such large returns in the diminution of suffering and death, as those which look to the prevention of tuberculosis in the tenement houses."

Lagneau, some years earlier, showed from statistics collected in 662 cities in France, that the denser the population, the greater was the number of deaths from tuberculosis. The death rate from tuberculosis per 1000 population in cities of 5000 inhabitants was 1.81, while in cities of 450,000

inhabitants it was 3.63, and in Paris, with upwards of 3,000,000, the death rate per 1000 rose to 4.90.

The reports of the Health of Towns Commission for Great Britain shows certain facts in regard to the city of Dundee, from which it appears that the rate of phthisis and other similar diseases increased with the overcrowding in dwellings. Taking the ratio of four rooms and upward as 10, it was found that for three rooms the rate was 17, for two rooms 20, and for one room, 23.

In a study of this subject, made in 1915, by Dr. A. Maxwell Williamson, Medical Officer of Health to the City of Edinburgh, Dr. Williamson maintained that the number of cases of pulmonary tuberculosis in any district is almost precisely in direct proportion to the number of tenements of one and two rooms that exist in it. He showed that in the city of Edinburgh during the years 1910, 1911, 1912, the period under consideration, while 1 per 1000 of the population were attacked by tuberculosis in flats of four and more rooms, 2.1 per 1000 was the rate in houses with three-room flats, 3.4 in houses of two-room flats, and 6.1 in houses of one-room flats. A study by wards in the city of Edinburgh showed similar facts. But the vital relation between overcrowding and tuberculosis was even more strongly shown by the study made by Dr. Williamson of the condition in three Scottish cities—Edinburgh, Glasgow and Greenock.

“In Greenock, for example, there were 87 deaths in houses of four rooms and upward, 106 in three, 179 in two, and 222 per 100,000 in houses of one room. In Glasgow, while there were 70 deaths in houses of four rooms and upward, there were 120 in three, 180 in two, and 240 in houses of one room; and in Edinburgh there were 56 deaths in houses of four rooms and upward, 111 in three, 146 in two, and 225 deaths in houses of one apartment.”

Dr. Williamson is strongly of the opinion that "the key to the situation lies unquestionably in the housing question. If statistics prove anything, they prove to the hilt that the disease originates and thrives in direct proportion to the unsatisfactory nature of the house and its surroundings; and they prove invariably that an improvement in these conditions is followed, as by the law of cause and effect, by an immediate fall in the tuberculosis death rate. Existing conditions especially must be actively dealt with. It seems largely to be beating the air if we continue to talk about town-planning schemes for the future, while our dense, crowded, unsanitary slums are found everywhere existing."

This article is of such great value that I cannot refrain from quoting Dr. Williamson's summary of his main points:

"1. Pulmonary tuberculosis is a disease which in 70 per cent or 80 per cent of cases occurs in houses of three rooms and under; the number of cases is larger in two-roomed houses than on three; larger in houses of one room than in two; and the number of cases of tuberculous disease increases almost in direct proportion to the number of small houses in any district or ward of a city.

"2. That since the year 1882 the number of deaths from tuberculosis has shown a rapid and steady decrease; and a like statement applies to the general death rate and the death rate from other forms of infectious disease.

"3. That this decrease has been taking place quite apart from, and irrespective of, any special effort to deal with the condition other than the preventive measures which have been carried out in the ordinary march of public health administration.

"4. That the establishment of sanatoria and dispensaries, while useful aids in carrying on a general crusade against this form of disease, are not of themselves likely to be

attended by markedly beneficial results in the absence of other definite preventive measures.

"5. That preventive measures center largely in the housing question, and that, irrespective of cost, there is urgent need, in the light of our present-day knowledge, of dealing more effectively than has heretofore been the case with congested areas, dense foci of population and unsanitary dwellings."

On May 2, 1908, Robert W. de Forest, then President of the Charity Organization Society of New York, and formerly Tenement House Commissioner, wrote as follows: "More than 300,000 persons sleep every night in dark, unventilated interior rooms in tenement houses of this city. These rooms have no windows even to adjoining rooms. This state of affairs is largely responsible for the fact that 10,000 persons die of tuberculosis in New York City each year."

"Bad housing" does not make so direct an appeal, either to the public or to department heads, as germs and microbes; it does not cause sudden death, but it does slowly and surely so undermine vitality and resistance to disease that people become easy victims to all ills, and especially tuberculosis.

In 1903, Ernest Poole described a typical New York tenement that he visited one night, ten feet square, where six people lay closely packed on the floor, trying to sleep, and where one of them was dying of consumption. Two small windows gave them air from a noisome court—a pit twenty feet across and five floors deep. There was one more room, six feet by seven, a mere closet with one grated window high up, opening on an air-shaft eighteen inches wide. In that room four more were sleeping—three on a bed and one in a cradle. A situation such as this is the stronghold of tuberculosis.

In New York City there is a group of tenements, referred to above, that is one of the most densely populated parts of

the world. This block has a population of nearly 4000. Halls, courts, and air-shafts are cramped, deep and sunless. It is a block of a thousand homes. The death rate from consumption here alone is so high as to earn it this unenviable name, the "Lung Block." It is not only a danger to those who live in it, but from it the disease is constantly spreading to others all over the city—rich and poor alike.

One of the inalienable rights which belongs to every one is the right to have plenty of fresh air and sunshine. Life in a cellar, in a hall bed-room, and in bad tenements everywhere precludes the possibility of sunshine and fresh air. As long as such houses and rooms are allowed to exist, life will exist there, and just so long will we have pale, poorly developed and under-nourished children, future candidates for consumption. The remedy is not to remove people from such dwellings and to cure their consumption, but to remove such dwellings from the face of the earth, and thus to *prevent* consumption.

Building laws should be more adequate, and above all, should be enforced. Inspection of tenements should be more than a mere routine. There should be a definite limit to the narrowness of any given lot and to the proportion of this lot that may be built upon; likewise, there should be a definite amount of cubic air space for each individual. Dark, unventilated rooms must be eliminated, and the number of individuals allowed to sleep in one room carefully limited. Ernest D. Easton, Secretary of the Newark Antituberculosis Association, discusses this question frankly and boldly. He quotes Dr. Goler, Health Officer of Rochester, New York, as saying, when asked if he believed in model tenements: "Not until we have a model toothache or a model boil can we have a model tenement house." Mayor Baker of Cleveland said sometime ago that he was not so much interested

in Cleveland having a population of 1,000,000 people in 1920, as he was in having Cleveland a fit place for a million people to live in.

In Brooklyn in 1913, the Tenement House Committee, instead of devoting its attention to the landlord's part in the tenement house problem, began a campaign to teach the tenement house dweller not only his *rights* but his *duties*. Two flats were opened in different parts of the city where object lessons were provided in what constitutes good house-keeping, economical buying and cooking, ventilation, etc. This is an important step in the right direction.

The solution of this problem, that of tuberculosis in its relation to that of housing, involves various factors. Among these may be mentioned:

1. Education of the tenement owner, the tenement dweller, and of the public at large.
2. Adequate regulations and their rigid enforcement in regard to inspection of tenements, building laws, etc.
3. The construction of suitable dwellings for the working classes.
4. Increase and improvement in the methods of transportation so as to increase the number of suburban, and decrease the number of urban dwellers among the working classes.

One of the most interesting attempts to carry out one of the suggestions made above is that known as the East River Homes Foundation. Mrs. William K. Vanderbilt generously provided a large endowment for the construction of suitable dwellings in the heart of New York City, where workingmen who had tuberculosis themselves, or who had it in a member of their family, could live under proper conditions and medical supervision. The buildings now house 383 families in suites of from two to five rooms. The details concerning this experiment can easily be found elsewhere. It is as yet too soon

to determine whether such an attempt as this will prove to be of real economic value and anything more than an interesting and benevolent philanthropy. It is certain, however, that this method alone, no matter how beneficial it may be to those fortunate enough to be able to avail themselves of it, will never solve the problem of the tenement and tuberculosis.

No one must think for a minute that bad housing alone is the sole cause of the prevalence of tuberculosis, nor must anyone be so sanguine as to imagine that the building of model tenements, no matter on how large and magnificent a scale, is going to eradicate that disease from our midst. We must bear in mind that along with bad housing, and really back of it all, is poverty and ignorance on the part of the working classes, and greed and ignorance on the part of the landlords. That the working classes are generally ignorant as to food values, and that their food is in many instances, solely because of ignorance, poor in quality, amount, proportion and cooking, is a well known fact, while on the other hand it is only fair to state that it is *ignorance* and not altogether greed or viciousness on the part of landlords that allows such conditions as described above to continue to exist.

Bad habits and the liquor problem are undoubtedly factors in tuberculosis, to a certain extent at least. Insufficient wages, poor working conditions and other features enter into this problem. On the other hand, no one who has taken the opportunity of inspecting personally one of the tenements where many of the working population live, and are forced to live, can help but believe that tuberculosis must continue to flourish in their midst as long as such tenements exist.

In an article published in 1920, Frank F. D. Reckard presents his suggestions and conclusions as to the relation of

housing to pulmonary tuberculosis. His studies are based on over 18,000 cases. This work, one of the latest and most comprehensive on this subject, is of great interest and value. I cannot do better in closing this chapter on this most important subject than to summarize his own conclusions, as follows:

1. If the children are to be the sanitarians of the future, there must be systematic health instruction in the public schools. It is to be hoped that children as well as adults thus instructed will not be satisfied to continue to live in an atmosphere or environment which they can improve by putting into execution some of the knowledge obtained.

2. More publicity is needed so as to place the needs of a town or city before the general public, who may be ignorant of existing conditions. By the demand of the public many evils such as overcrowding, improper sanitation and poor ventilation in public places, may be eradicated.

3. Greater effort should be made to provide more fresh air schools. It is hoped that in the future all schools will be conducted on the fresh air plan.

4. It is important and necessary that employers be kept reminded as to their duty to their employees.

5. The establishing of health centers in each of our cities and in representative towns in rural districts should be urged.

6. The value of sunlight should be kept constantly before the public, sick or well.

7. However much we may improve the most unsanitary house or room, whether in city tenement or village cottage, to make it habitable for either sick or well, if we neglect to improve the occupants of the house, all our efforts will be of no avail. Sanitary housing and personal hygiene are inseparable. They must go hand in hand.

8. There is no disease where cure depends more absolutely

upon the intelligent study and regulation of every detail of life throughout the twenty-four hours, by the combined forces of sanitation, nurse and physician than tuberculosis. It is only by education and education of the highest type that we have any reasonable prospect of cure.

9. It is the duty of every physician to influence public opinion so that the evils incident to bad housing, occupational environment and sanitation may be improved, in order that the children, the hope of the future, may be given a chance.

These words represent "good housing" in its broadest and highest meaning.

CHAPTER XI.

TUBERCULOSIS AND OCCUPATIONS.

MOST of us spend approximately one-third of our lives in bed, asleep or not, as the case may be, one-third eating, resting or playing, and one-third at work. Whether or not we are in good health and maintain our bodily vigor and strength depends on how we spend these periods. In this chapter the relation of health and of tuberculosis to work and occupations will be considered.

There are certain occupations that have earned the unenviable name of "the dangerous trades." Volumes have been written on this, and at the present time doctors, scientists, employers and employees all over the country are giving an immense amount of thought and time to the subject of industrial medicine and the prevention of industrial diseases. Industrial diseases are those that develop or are liable to be associated with certain industries or occupations. Typhoid fever, for instance, cannot be classed as an industrial disease because it is not associated with any particular trade or industry, while stone-cutter's phthisis or zinc or brass poisoning are true examples of industrial diseases. Of all such diseases, tuberculosis ranks first. Therefore, an intimate acquaintance with the conditions and factors that cause the development of tuberculosis and its increased incidence in some industries as compared with others is of the utmost importance if we are to attempt to remedy these conditions. In too many instances we find ourselves powerless to provide

proper and adequate sleeping quarters for the working classes; we may teach them to open their windows at night, but what does it avail if the window opens on a dark and dirty shaft where neither sunlight nor fresh air can penetrate? We can preach and urge proper methods of bathing, eating and playing, but we can seldom provide the wherewithal to carry out what we advise.

With a man's work or occupation, however, it is often different. Not only is there legislative provision which demands certain hours and conditions of work and prohibits others, but of infinitely greater importance than this, there is the force of public opinion that is making itself felt in this direction. Both capital and labor are realizing that the preservation of human health and efficiency means increased earnings and output, as well as health and happiness for both the employer and the employed. Sanatoria, hospitals and dispensaries play their part, and a most important part in health work, but such institutions deal primarily with sick individuals and their treatment and cure rather than with the fundamental conditions that caused them to become sick in the first place. Anything that can be done, therefore, to eliminate those factors that tend toward the development of tuberculosis and thus to maintain the health of workers so that they will not contract tuberculosis, will not only increase our industrial output and improve economic conditions, but will also be of great help in our antituberculosis campaign.

Let us consider, therefore, those occupations that are dangerous as far as tuberculosis is concerned. A trade may be dangerous in two ways, (1) by the nature of the work itself, and (2) because of the conditions under which the work must be done. Prominent in this last group are the stone-cutting and polishing trades, and the cutlery and

tool industries. The flying particles of steel and stone and dust from steel or emery wheels are inhaled and keep the lungs in a constantly irritated condition, and thus favor the development of tuberculosis. This is particularly marked in stone-cutting, an industry carried on under good conditions—usually out of doors where there is plenty of light and air—but where the workmen are constantly exposed to large amounts of irritating dust. So frequent is the development of tuberculosis in this trade that “stone-cutters’ phthisis” is only too common a diagnosis in localities where such work is done. At the Massachusetts General Hospital in Boston, where patients from all over New England come for examinations and medical advice, the physicians from long experience at once associate in their minds a patient coming from either Quincy or Fitchburg, the two big centers of the granite industry in this state, with the picture of consumption. The death returns from a city in Massachusetts, one of the centers of the cutlery and tool industry, during a twelve-year period from 1895 to 1906 show that tuberculosis was given as the cause of death in 54 per cent of the “grinders” and “polishers,” and that diseases of the lungs were responsible for over 72 per cent of the deaths among this group. Of 343 deaths in the city of Quincy during a sixteen-year period, 41 per cent were due to pulmonary tuberculosis. These figures are, of course, vastly higher than the average death rate from consumption for the state.

Among other trades that are dangerous on account of certain factors inherent to them are the various textile industries, paper-making, carpet and rug-weaving, and other dusty occupations. The textile industries in particular furnish an additional hazard because of the fact that the work being light, not requiring hard physical labor, appeals to the weaker members of each sex and to young persons,

whose resistance to tuberculosis is naturally lower than the average. The tobacco industry is not only a dusty one, and one that invites those with poor physique, but it is especially dangerous on account of the heat and generally poor conditions under which it is usually carried on. The jewelry trade exposes its workers to irritating fumes and gases, and the same holds true of the rubber industry. The boot and shoe workers are exposed to dust and the death rate from tuberculosis among them is high. Many other dangerous trades and industries might be mentioned, but the ones here given are the striking examples.

At a recent visit to one of the largest industrial plants in the country, I was taken to the building where sand blasting was carried on. In this work, sand under great pressure is blown against iron and steel castings in order to polish them down. The air was so thick with dust and sand that one could see only a distance of a few feet, despite the fact that there was an elaborate system of blowers. The workmen wore respirators or masks, but despite this it was manifestly impossible for anyone to work in such conditions without danger. In this particular instance, these men were examined every thirty days, and if the slightest evidence was found of any pulmonary disease, they were transferred to different work. This, of course, is a striking example of a trade that is necessarily a dangerous one on account of the nature of the work itself. Of those trades that in themselves are not dangerous, but become so on account of the unfavorable conditions under which they either must be or are usually carried on, there might be mentioned those that of necessity expose the workmen to great extremes of heat and sudden variations in temperature; where the air must be kept either excessively moist or excessively dry, or where it is difficult to provide sufficient sunlight and fresh air owing to the nature of the work.

One of the first instances of an employer taking active steps to protect his workmen from disease was in the little town of Oxford, Massachusetts. For several years the death rate from tuberculosis in this town had been extremely high. The chief and practically the only industrial plant consisted of one fairly large shoe factory. The owner of this factory, realizing that the high incidence of tuberculosis was doubtless in some way connected with his factory, decided to attempt to remedy this state of affairs. On March 1, 1906, he posted notices in prominent places in the plant, calling attention to the prevalence of tuberculosis, and stating that any employee who suspected he or she might have consumption, or who for any other reason desired it, would be given a free examination, and if found to be in need of it would be given free treatment for three months at a sanatorium. The foremen and superintendent of the various departments were instructed to be on the lookout for employees who appeared below normal in health, or who had a cough, or whom for any other reason they suspected of having lung trouble. This whole affair was managed quietly and calmly, without creating any alarm or excitement. The results were excellent—so much so that in a comparatively short space of time tuberculosis, except for sporadic cases, had ceased to be a cause of ill health in this community.

This movement to protect the health of employees and to eradicate tuberculosis as far as possible as an industrial disease next spread to Providence, Rhode Island, where Dr. Frank T. Fulton was the leading spirit in having similar measures introduced in certain large concerns of the city. As a result in a few months' time a considerable number of consumptives was discovered among the employees, none of whom were previously under medical supervision or treatment.

The following letter was written to the foremen in the different parts of the shops:

“Dear Sir: A notice will soon be posted regarding the treatment of consumptive cases. The results that are to be obtained will depend very largely upon the sympathetic manner in which these cases are handled. If you have among your men any whom you believe ought to be taken care of, we would like to have you consult with the writer, so that a course may be outlined that will tend toward bringing about the best results. Any details that are not upon the printed notice we shall be only too glad to give you in full.”

As a result of these notices and the subsequent examinations, in less than ten months, eighteen operatives were found to have active tuberculosis, none of whom, as far as could be determined, was under treatment or supervision of a physician. These patients were treated either in their homes, under medical supervision, or were sent to a sanatorium, with excellent results.

The effect of this movement on the individual patients, no matter how favorable the results might have been to them, was comparatively small compared with its effect on the employers, and on the mass of employees who, in particular, came to realize for the first time that their health was being given serious consideration. The good results which were obtained in these two mills led to a meeting at which were representatives of forty manufacturers in the city of Providence, employing a total of 35,000 to 40,000 operators, who agreed to adopt measures in their mills similar to the ones employed in the two original concerns. As Dr. Fulton, in describing this movement, states: “Originally the plan was for the purpose of detecting and treating the

disease (tuberculosis), but I am sure that its greatest value has been educational. It has caught the interest and attention of wealthy, influential and philanthropic business men, and at the same time has brought the subject prominently before the laboring class."

Dr. William H. Coon, State Inspector of Health in Massachusetts, discussing this subject, writes as follows:

"Were any employer of labor to be asked which he would prefer to employ, a well man or a sick man, he would undoubtedly consider that he had been asked a nonsensical question, and, if he replied at all, would probably state that he would not employ a sick person if he were aware of that person's illness.

"Were the same employer asked, however, 'How many of your employees are in good health and able to give you their best work?' an answer might not so readily be forthcoming."

He calls attention to the fact that employers of labor and manufacturers everywhere realize that it is a distinct paying proposition to observe the principles of factory sanitation as to light, air, removal of dust, etc., and that better results are obtained in terms of dollars and cents by so doing. He likewise calls attention to the fact, however, which very few employers seem to realize, that it would also pay, and pay well, in terms of dollars and cents, to see to it that their employees are in good health and are capable of giving their best efforts, through each working hour of the day, to the work on which they are engaged. This maximum efficiency cannot be obtained unless the employees are in good health, which in turn requires that there be a carefully planned and carefully carried out system of medical examination of employees.

The efficiency of any machine, and the quality of the mate-

rial which this machine produces, depend to a very large extent upon the efficiency of the person operating the machine. Unless the health of the operator is considered, the quality of the work is bound to suffer. The chief reasons why this self-evident fact is not recognized, and its principles put into action are:

1. The lack of sufficient appreciation on the part of business men in regard to the health of employees as a factor in industrial efficiency.

2. The absence of a systematic supervision of the health of employees while at work.

3. A lack of knowledge on the part of employees concerning the maintenance of their health, and the prevention of disease.

The passage of various laws under the general heading of Workmen's Compensation Laws and Industrial Accident Laws and Regulations, have been a most potent factor in making employers realize their responsibility in this matter. In Massachusetts, the Industrial Accident Board has defined as a "personal injury," "any injury or damage or harm or *disease which arises* out and in the course of the employment which causes incapacity for work and takes from the employee his ability to earn wages."

This is a broad and most important ruling. Under such a ruling, an employee who, in the proper course of his work, develops tuberculosis, can obtain compensation, *providing* that it can be demonstrated that owing to the nature of the work he was unnecessarily exposed to certain dangers, against which he was not warned, and to remedy which no measures, or insufficient measures were taken.

From the point of view of the operator, the insurance companies are showing active and increasing interest in seeing to it that their policy-holders are working under proper

conditions, and are insisting that workers receive periodical physical examinations, so that disease may be detected in its incipience. Even though the motives which led to this increased activity among employers to remedy certain bad conditions may not have been of the highest, and in most instances, have been based on dollars and cents, rather than on any personal interest which they have felt in preserving the health of their employees, the result, nevertheless, under the present condition of affairs, is distinctly encouraging.

There are, of course, striking exceptions to this—the somewhat skeptical attitude of employers toward any proposition to protect the health of their employees. While it must be admitted that the average manufacturer does not install any elaborate system of medical inspection and examination until he is satisfied that it will result in an increased output, there are, however, many individual instances where most up-to-date and comprehensive systems have been installed without any thought, except that of the welfare of the operatives. One large concern, for instance, has come to realize that proper vacations are essential to efficiency, and insists upon such vacations for certain classes of employees.

Dr. Frank S. Billings of Chicago describes the enviable conditions that he knows to exist in one very large corporation, as follows:

“The conditions under which the employees work are of the very best, the companies realizing that proper light and ventilation, rest and retiring rooms, lunch rooms supplying appetizing food and frequent rest intervals, pay for themselves many times over in a healthy and happy working force. There are no occupational diseases in this industry. Because a large proportion of the employees come from the age group that is particularly liable to pulmonary and nervous disorders,

the employees have their share of such ailments. But the incidence is well below that of the general public, and that of most other business organizations.

"A generous Benefit Fund (maintained by the companies, with no contributions from employees) furnishes ample care in accident and sickness, and also provides for pensions, death benefits, etc.

"Medical Departments, with physicians, nurses, excellent quarters and ample facilities are maintained.

"The local facilities for care are extremely good, particularly in New York where hospital, sanatorium and dispensary facilities are readily available and are of a high degree of excellence."

Another firm has developed this work along educational lines and has provided a library and reading rooms, and instituted a series of lectures and talks on various health topics. Numerous other concerns might be mentioned that have done splendid work in this form of preventive medicine.

There should be periodic examination and timely repair of human machinery, just as there is already periodic inspection and repair from time to time of the various machines in the shops. In the detection of no other disease does the value of supervision of the health of workers stand out as prominently as in tuberculosis. With its slowly developing group of symptoms and its gradual onset in a large number of cases, tuberculosis passes beyond the curable stage before attracting attention, unless there is some system of regular periodic examinations. Such a plan for detecting tuberculosis among employees should include:

1. A physician to examine all suspicious cases.
2. A trained nurse to assist the physician.

3. The examination of employees in whom a diagnosis of tuberculosis has previously been made, or whose poor general condition suggests the presence of the disease, or those who

have a protracted or recurring cough, and, finally, those in whose families or homes a case of tuberculosis exists, or in which a death from tuberculosis has occurred.

4. A tuberculosis clinic.

The watchwords of any such movement as this should be: *education, detection and control.*

This subject has been well summed up as follows: "Strengthen and develop the human machine in every possible way, and then 'keep tabs' on it so that strain or weakening may be detected at the outset and a break-down averted. Medical examination of employees, at least once a year, is just as necessary as the inspection of other machinery, and no statistical proof is needed to support such a contention. Many have looked upon the work (medical examination of employees) as useful only in weeding out the diseased employees, especially those suffering from consumption.

. . . This is most important, but the chief gain is in raising the general level of fitness in the force, and making it possible to give men the kind of employment that they are physically adapted to engage in."

It is encouraging to note that more and more manufacturers and large employers of labor have come to realize the importance of keeping the human, as well as other kinds of machinery, in fit condition by periodical examination. Although in many cases this realizing sense has been brought home to these men by financial reasons, and by pressure brought to bear by insurance companies and legislation dealing with industrial accidents and workman's compensation, nevertheless, the results of this movement are bound to bring about a great deal of good, and to help in reducing the present high mortality from tuberculosis, as well as that from other diseases in certain occupations. It will also help in rendering safe certain occupations, which are now classified as dangerous.

CHAPTER XII.

TUBERCULOSIS PROGRAM FOR SMALL CITIES AND TOWNS.

IN handling tuberculosis, the problem of the smaller communities is often a more difficult one than that of the larger centers of population. It is manifestly impossible to lay down any definite set of rules, regulations, or suggestions, according to which any large community should conduct its campaign, and it is likewise plain that each large community must decide for itself, according to its own local conditions, as to how best to act in this matter.

With smaller communities it is different, so that it is possible to provide a fairly definite program which has been found by wide experience to be practical and efficient. Let us take, for example, a manufacturing community of from ten to twenty thousand inhabitants which up to the present time has done little or nothing in an organized way to check tuberculosis. There are unfortunately hundreds of such towns in every state. While practically everywhere in this country tuberculosis is a reportable disease, an aggressive campaign against it cannot succeed if based on this alone. Nor, in the vast majority of cases will it succeed if left entirely to the properly constituted authorities such as local boards of health. One potent reason why in some communities tuberculosis flourishes while in others it is fairly well controlled is because in the former the public, including the medical profession, has denied any responsibility of its own

in this matter, and has said, "This is a Board of Health problem. Let that Board attend to it."

Tuberculosis has not been and cannot be controlled in this way. The problem is too immense, and has too many ramifications in every walk of life, for any one board or group to cope with it. Coöperation of every known agency that can help in any way is essential. Political, social, racial and religious lines must be discarded. If possible, every one, including children, must be made to feel that he has a duty to perform in this regard.

In general, what an antituberculosis campaign in such a community as this would aim to establish is somewhat as follows:

1. A local antituberculosis society.
2. A tuberculosis dispensary.
3. A tuberculosis instructive nurse.
4. Close coöperation with a state or county sanatorium for favorable cases.
5. A nearby hospital for more advanced and emergency cases.
6. Close coöperation between the local tuberculosis society and the local board of health.
7. An out-door school or fresh-air rooms for delicate children.
8. Adequate medical inspection of school children.
9. Close coöperation with the physicians and nurses of large mercantile concerns, factories and other leading industries.
10. Coöperation with the church, labor and other organizations working for social and civic betterment.

It would take years of hard and patient work to bring about that ideal condition of affairs which would result if everything mentioned in this list were accomplished. In

fact, there is probably no community in this country where this happy state of affairs exists. There are many communities, however, that have started in with nothing except a firm determination to control tuberculosis that have reached a very high standard of efficiency.

The first thing to do is to form an antituberculosis association or committee. It is not difficult to do this. It is often difficult, however, to keep it alive after it is once formed. Usually, the best way to start such a movement is to hold a tuberculosis exhibit. Such exhibits can be obtained from the National Tuberculosis Association, from any State Association, and from other sources. A large hall should be hired and various committees appointed to arrange the details. There should be a committee on publicity to advertise in the papers, stores, schools and churches the coming exhibit, and the reason for its coming. A finance committee should interview local authorities, influential citizens, churches, labor organizations, women's clubs, etc. A committee on public speakers should arrange a program of short addresses for every afternoon and evening during which the exhibit is to be held, with a judicious mixture of in and out of town speakers. There should be a special afternoon for school children and their teachers. It should be announced at every meeting that it is planned to form an antituberculosis association, and there should be a book provided at the door where those entering can sign their names and by payment of nominal dues become members.

After the exhibit has left the town or city, there is liable to be a reaction and unless some active steps are at once taken, all that has already been done will result in nothing. Among such active steps should be the formation of an antituberculosis association, or a committee, with the appointment of officers and with a constitution, by-laws, etc. The

public should be kept informed of everything that is done and the membership of the various committees should include persons representing all the important interests of the community.

The association, once formed, should then get to work on some definite object. Whether this is the establishment of a tuberculosis dispensary, the appointment of a tuberculosis instructive nurse, a day camp, an open-air school, or a local tuberculosis hospital, depends upon the individual needs of the community. Educational work should be an important feature of the program of such a society. Lectures may be given by local physicians and others without cost, or speakers from outside can usually be obtained at slight expense from nearby sanatoria, state boards of health, state tuberculosis associations, or by applying to the National Association. Outlines for such lectures with lantern slides can be obtained from the sources mentioned above. Such lectures or talks are usually of more benefit if they are given to comparatively small groups, such as schools, clubs, lodges, labor organizations, etc. Small portable tuberculosis exhibits, motion picture films, can easily be obtained by applying to the same sources. It is important and usually not difficult to obtain newspaper publicity. The National Tuberculosis Association, whose headquarters are in New York City, will provide free monthly press bulletins, while of special importance, in addition to these are items of local interest. Instructive literature for distribution can be obtained at a slight cost from the National or State Association. Whatever is placed before the public in the lay press should be couched in plain simple newspaper English and should contain *news*.

As a general thing, in addition to the educational work, the appointment of an instructive tuberculosis nurse will accomplish the greatest good, both to the patients themselves

and in arousing public interest. The salary that such a nurse receives, of course, varies. The minimum for such a full time nurse should be at least \$1200 per year and traveling expenses. Such a nurse should have training in social service work as well as in nursing. Her duties should be to locate unsanitary conditions or other causes contributing to the spread of tuberculosis; to look up indigent consumptives, and especially those who are sources of infection; to induce members of families in which there is tuberculosis to be examined, especially the children; to talk to the teachers and to school children on the principles of the prevention of disease and the rules of good health, and to secure the coöperation of the medical profession, the board of health and of charitable organizations.

As a result of her investigations, it will soon become manifest as to exactly what step the society should take next, whether there should be more nurses, or an open-air school, or a dispensary, a sanatorium, or a local hospital. It is better to take these one at a time, and to concentrate the society's energies on one thing, rather than to spread them thin over a large area.

It is of the utmost importance not to antagonize either the medical profession or the local town or city officials, particularly the local board of health. The nurse offers the best means of securing their coöperation and especially that of the medical profession. She should visit each doctor in the community, if possible, and explain the aims and objects of the association and how her work will help the physician with his patients, rather than hinder him. The society officers should include, if possible, some member of the city government, whose duty it will be, either alone or as the head of the committee, to secure the coöperation and interest of his colleagues.

While it is undoubtedly better that practically all of the above described work should be undertaken and carried out by the town or city government and not by voluntary organizations, nevertheless, it has been true in the past, and in most places will continue to be true for some years to come, that such work as this must be started by voluntary organizations. The need of it must be demonstrated to the public, and the city fathers must receive clear and manifest proof that not only is this work a good one and a necessary one, but that from the dollars and cents point of view it is a good investment for the town or city to make. Finally, those undertaking this work should constantly bear in mind that in the long run more will be accomplished by taking one thing at a time and doing it well, and by adding to this gradually, than by attempting to lay out a broad and far-reaching scheme from the very beginning, and to try to accomplish everything at once. Attempts in this latter direction will usually end in failure while experience in the past has shown that the first method will bring about success.

There is no better example to be found anywhere in this country, or in any other, as to how best to handle the tuberculosis problem in a small city than the "Community Health and Tuberculosis Demonstration" now being carried on in Framingham, Massachusetts, under the auspices of the National Tuberculosis Association. Literature giving all the details concerning what is going on here, is available to all, and should be given careful study by any person or any organization about to undertake the solution of a community tuberculosis problem.

CHAPTER XIII.

BOVINE TUBERCULOSIS.

DR. ROBERT KOCH, of Berlin, discovered the tubercle bacillus in 1882. Several years after this, French observers found that the germ of tuberculosis could be divided into two classes, one, the avian type, which attacks birds; the other, the mammalian type, that attacks mammals. In 1896, Dr. Theobald Smith, of Boston, again subdivided the mammalian group into two divisions (1) the human type, which causes tuberculosis in human beings and rarely in animals, and (2) the bovine type, which attacks animals and does not cause so much disease among humans. There was a great difference of opinion concerning this announcement by Dr. Smith, each side having many strong adherents. In 1901, Dr. Koch caused a sensation when he announced that in his opinion bovine bacilli might be considered a negligible factor as a source of danger to public health. Further discussion and investigation followed, with the result that at the present time it is believed, (1) that the tubercle bacilli that attack mammals, including the human species are of two distinct but closely related types, the human and the bovine, and (2) that both the human and the bovine types are found in human beings. In view of the fact that tuberculosis is so common among cattle, and that food products from this source, meat and milk, form such a large proportion of food among humans, it is most important to determine how large a factor the bovine type of organism really is in causing human tuberculosis.

The largest individual series of cases that has been carefully studied with this point in view has been reported by Dr. William H. Park, of the New York Health Department. Out of 438 cases of tuberculosis in human beings, 7.1 per cent showed bacilli of the bovine type. Out of a total of 1038 cases collected from various sources, including Dr. Park's figures, 9.7 per cent showed bacilli of the bovine type. Dividing these cases into three groups, according to age, of those persons sixteen years of age or older, only a little over 1 per cent showed that their form of tuberculosis was of the bovine type. In the case of children, however, ages of five and eleven years, the situation was far different, 25 per cent having bovine tuberculosis, while of those still younger, less than five years of age, nearly 27 per cent had the bovine type of disease. Previous to compulsory pasteurization of milk in New York City, Dr. Park found 75 per cent of a large series of tuberculous glands in children to be due to bovine tuberculosis. A recent investigation since widespread pasteurization of milk in New York City has been instituted shows that this proportion has fallen to 29 per cent.

Taking the most conservative figures, it is safe to conclude, then, that bovine tuberculosis is of importance chiefly among children, and that it is the source of about one-sixth of all tuberculosis that develops into clinical and manifest disease among children between five and sixteen years of age, and of more than one-fourth of such disease among children under five years. It should likewise be borne in mind that for some unexplained reason, bovine tuberculosis rarely affects the lungs, but instead is usually to be found in the bones, joints and the glandular system. This, of course, in no way alters the seriousness and importance of the problem. We may justly look upon the tuberculous dairy cow, as conditions exist at present, as responsible for practically all the human

tuberculosis that is not caused by tubercle bacilli expelled from the bodies of tuberculous humans.

In the United States, it is estimated that about 10 per cent of all dairy cows are tuberculous. Such cows need not be visibly diseased in order to expel tubercle bacilli from their bodies. As Dr. E. C. Schroeder said in 1907, "The dangerously tuberculous cow is an animal that may long retain the appearance and general semblance of perfect health. Failure to obtain direct evidence that a tuberculous cow is dangerous does not prove that the tuberculous cow is safe. The tuberculin test is the only accurate way of determining whether or not a cow is dangerous. Tuberculous cows do not expel tubercle bacilli until some time after they contract the disease. This suggests the importance of periodic application of the tuberculin test, and the segregation of all reacting animals. Our dairy herds may be cleaned of tuberculous cows by the proper application of the tuberculin test and the segregation of all reacting animals." Tuberculosis among cattle, therefore, must be looked upon as a condition to be vigorously fought until bovine tuberculosis is eradicated.

The final report of the Royal British Commission appointed in 1911 to investigate this subject concludes as follows: "In the interests of infants and children, the members of the population whom we have proven to be especially endangered, and for the reasonable safeguarding of the public health generally, we would urge that existing regulations and supervision of milk production and meat preparation be not relaxed; that on the contrary the government should cause to be enforced throughout the kingdom food regulations planned to afford better security against the infection of human beings through the medium of articles of diet derived from tuberculous animals. Bovine tubercle bacilli are liable to be abundantly present in milk when there is

tuberculous disease of the udder of the cow from which it was obtained. This fact is generally recognized but not guarded against. But these bacilli may also be present in the milk of tuberculous cows presenting no evidence of disease of the udder, even when examined post mortem."

The International Commission on the Control of Bovine Tuberculosis considers this subject a most important health problem and one which should have the approval and support of all persons who are interested in curtailing human suffering and prolonging human life. This commission recommends the following methods for instructing laymen, veterinarians, physicians and public health officers in the control of bovine tuberculosis.

1. Publication in agricultural and dairy papers of carefully and accurately prepared articles on the subject of bovine tuberculosis, its cause and prevention and the importance of a clean milk supply.

2. Publication of similar articles in veterinary, medical and sanitary papers.

3. Lectures and demonstrations on this subject through agricultural societies, granges, farmers' institutes and unions.

4. Lectures on the subject in town, county and state fairs.

5. Sending literature to veterinary and medical colleges and schools of sanitary science in the country.

6. A pamphlet for laymen on the subject in plain language, to be printed and distributed free.

7. Departments of Agriculture, state veterinarians, live stock boards, etc., be instructed to promote the educational features of their work.

The wholesale pasteurizing of milk has been urged as the best measure to control infection from this source. This, however, if enforced without certain other restrictions and regulations, would put a premium on dirty milk, and would

convey a false sense of security. Under such a regulation as this, large amounts of dirty and old milk, otherwise unsalable, could be put upon the market. Any regulation, therefore, requiring or advising the wholesale pasteurization of milk should be limited to milk coming up to certain definite standards. Education along with proper regulation will bring about the best results.

CHAPTER XIV.

THE CARELESS AND INCORRIGIBLE CONSUMPTIVE.

IN the whole field of tuberculosis work, there is no more difficult problem than that of the careless, ignorant and incorrigible consumptive. There is no board of health, state or local, and no private or voluntary organization that has not met with this problem, and has not usually failed to solve it.

To the casual observer the solution may appear to be simple enough. In every state in this country, tuberculosis of the lungs is classified according to law as a communicable disease, meaning thereby that it may be communicated from one person to another, and is, therefore, a disease dangerous to public health. It comes, as far as the law is concerned, under the same category as scarlet fever, diphtheria, or small-pox. When it comes to enforcing the law, however, one immediately finds that in the minds of the public and, indeed, to a certain extent in those of the medical profession, the situation is very different. While the public accepts as right and proper regulations concerning the isolation of those sick with scarlet fever, diphtheria, smallpox, etc., and looks upon such measures as necessary for the protection of public health, it does not regard tuberculosis in the same light. The result is that as far as the public is concerned, the most advanced consumptive may expose those about him to his disease with impunity. It is a simple procedure for any

board of health to remove from his home to the proper isolation hospital a patient with diphtheria, for instance, when this seems necessary, even against the patient's own wishes or those of his family. It makes no difference whether the patient or his friends approve of such action, providing that in the opinion of the health authorities he is endangering public health by remaining where he is. An appeal to the courts would meet with little sympathy, and indeed in all those cases in which such an appeal has been made, the action of the health authorities has been upheld in practically every instance.

With tuberculosis, the situation is very different. Although this disease does infinitely more harm than diphtheria and all the other acute infectious diseases of childhood combined, because of the fact that the patient may not appear to be acutely sick, even up to the last stages, and may be able to be up and attend to his regular duties even when far advanced in consumption, the public has become accustomed to look upon a consumptive as a comparatively insignificant source of danger as compared with a person sick with diphtheria or scarlet fever. Indeed, we may as well admit that as far as healthy adults are concerned, this is undoubtedly true, which very fact makes our problem all the harder. We are coming to realize that the danger to normal adults from living even in fairly intimate contact with the intelligent consumptive is not great. *Providing that the patient has sufficient intelligence and is willing and able to take the proper measures to protect others from infection*, the chances are that he does little harm in the way of giving his disease to other normal and healthy adults. This, of course, does *not* apply to children, because, as stated before, it is in childhood that infection with tuberculosis takes place. It is only in the rarest instances, if ever,

that a person with active tuberculosis is not a source of danger to children if he lives in close contact with them.

It is evident then that the situation is a difficult one. The fact that the intelligent and conscientious consumptive is rarely a source of danger to healthy adults, makes it extremely hard to deal with a consumptive who is unwilling to take proper precautions, or one who has not intelligence enough to see that such precautions are necessary. I do not believe that further legislation is needed. In most states there are enough laws to deal with this problem, providing these laws could be enforced. Up to the present, drastic attempts to carry out the law have accomplished little and perhaps may have been said to have done harm in that the inevitable appeal to the courts which has resulted in these cases has usually been in favor of the patient and against the health authorities.

The solution of this problem is certainly difficult, but not impossible. What is essential is an educated and enlightened public opinion. Several years ago, Richard C. Cabot said that the time was coming when a case of typhoid fever would be looked upon as a disgrace to that community in which it occurred. This time may be said to have arrived, in many communities at least. The time likewise is approaching, and is not far distant, when an enlightened public opinion will not only permit the forcible isolation and segregation of the consumptive who is wilfully endangering the health and lives of those about him, but will demand that this be done.

To bring about this millennium, the utmost patience, tact, and perseverance on the part of health authorities are necessary. The problems of dealing with the chronic typhoid carrier and the diphtheria carrier seem to have been solved, not only without causing a wave of popular indignation in

behalf of these unfortunate individuals, but with the full consent and approval of the public. Such chronic carriers of diphtheria and typhoid fever, however, are fortunately comparatively rare, but chronic carriers of tuberculosis of the unintelligent and incorrigible type are even now far too common.

One other important phase of this question should be borne in mind. It must be evident to every one that even if we educate the public up to the point of permitting the forcible removal of incorrigible consumptives, little or nothing can be done unless we also furnish proper hospital facilities near at hand for the care and, if necessary, confinement of such persons. State sanatoria or hospitals where the grounds are extensive and a large amount of freedom for the patients is a necessary feature, will not suffice. In no state sanatorium is there provision for the confinement of any consumptive against his will; in the vast majority of cases he is quite at liberty to come and go as he wishes. During the summer months, a very common report concerning the discharge of many patients is that they "absconded." There must be, therefore, for the vicious, ignorant and incorrigible consumptive either a local tuberculosis hospital where the patient can be put to bed and kept in bed, if necessary, or, better still, a special institution similar to those for the criminals and insane, where the inmates can be given proper treatment and yet kept within certain definite bounds, and from which they cannot "abscond." This latter is probably the best solution of the problem. At the present time I know of no institution specifically devoted to this purpose. In Massachusetts there have been very few successful attempts by local authorities to enforce by legal measures the removal of this type of consumptive.

The city of Boston has carried out the forcible removal of consumptives as follows:

1910	24
1911	23
1912	25
1913	16
1914	10
1915	16
1916	33
1917	8
1918	2
1919	0
1920	1
1921	1

I know of very few other instances where forcible removal has been successful. Attempts in this direction continue to be made, however, and it is to be hoped that they will be made with increasing frequency as the public becomes educated up to the point to realize the necessity of so doing. For the past few years a bill has been introduced into the Massachusetts legislature to deal with this situation, known as the "incurable consumptive act," but it has been as regularly defeated even though couched in the mildest terms so that the "personal liberty" of the individual is not encroached upon. I doubt if any such bill will ever be passed, and I hope, and indeed believe, that by the time it has been passed, it will have become unnecessary.

In some communities, as often happens, public opinion has gone from one extreme to another, thereby doing harm and injustice, not only to individuals, but to the whole cause of antituberculosis work. One recent case is recorded where a child with tuberculous glands of the neck, not broken down or discharging, so that in no conceivable way could this child be source of danger to anyone, was kept from going to school and from using the public library in the town in which she lived because she had a "communicable disease."

Such an attitude as this on the part of local health authorities is not only unintelligent, but harmful. On the other hand, a recent case was reported in Massachusetts where a man in the advanced stages of tuberculosis was deliberately disregarding every law of hygiene and decency in regard to promiscuous spitting, and was apparently endeavoring to infect those about him. His own family wished him removed to a nearby tuberculosis hospital, but he refused to go; local health authorities could not, or at least would not, do anything, and efforts of the state department of health were unavailing until a nurse was sent to see him, who argued and pleaded with this man until finally he consented to follow her advice.

For many years to come the problem of the "incorrigible consumptive" will be a difficult and distressing one. Its solution means education of children, education of their parents, education of the medical profession, and education of legislators.

CHAPTER XV.

PRESENT NEEDS OF THE TUBERCULOSIS CAMPAIGN.

TUBERCULOSIS SURVEYS.

UP to the present time we have taken much for granted in our antituberculosis work. We have taken it for granted, for instance, that in some communities there is a large amount of tuberculosis, and that in others there is little or none. We have assumed that because few cases of consumption are reported in a given community that few cases of tuberculosis exist in that community. We have inferred that because few patients come to this or that dispensary the need for the dispensary is slight.

This must be changed. We have now reached the stage when we must quit this attitude of expecting that the tuberculosis patient will come to us. This policy of watchful waiting must be abandoned, and a more active policy instituted. We must seek out the patient; we must find him and force him, even against his will, to take proper measures to protect himself and the community. We must take measures, harsh ones, if necessary, to stimulate and prod the medical profession and boards of health into greater activity.

Some fifteen years ago when I first started in tuberculosis work in the Out-patient Department of the Massachusetts General Hospital, I found the tuberculous patient to be the

stray dog of the clinic; an unwelcome guest, to be kicked here and there, and to be gotten rid of as soon as possible. He was given a prescription for some cough medicine or a tonic, and was told to return in a few weeks, the interval usually being made as long as possible. Such conditions must be changed. We must adopt an aggressive attitude toward tuberculosis. We must not wait until tuberculosis is at our doors, until it comes to us, but we must take the initial step and go out after it.

How can we best do this? The preliminary step is to make a survey of the situation as far as tuberculosis is concerned. Too much have we in the tuberculosis campaign dealt in vague generalities. We have taken the reports of local boards of health, for instance, at their face value. Because few cases were reported in any given community we have assumed that there were few consumptives in that community. Because a certain town or city was rich, prosperous, and had little or no tenement life in its midst, we have concluded that there was and could be no consumption in that community.

We must change our minds as to this. Because a certain city in my own state maintains an excellent tuberculosis hospital, the beds of which have never been more than three-quarters filled, we have taken it for granted that this city was more than doing its duty as far as tuberculosis was concerned. This city finally asked for a survey, in order to obtain more money from the State for the support of its tuberculous patients. The result of this survey demonstrated the fact, beyond the shadow of a doubt, that while the hospital was an excellent one and the patients given the best of care, and while there was an excellent tuberculosis dispensary with high-grade physicians in attendance, the city was not meeting or nearly meeting its problem. Over 50

patients were found who had kept at their work in factories and mills until within one month of their death from consumption, and over 150 patients were discovered who remained at work until within three months of their death. The beds in the local hospital had remained vacant, not because there were no patients to fill them, but because these patients were not aggressively sought after and sent to the hospital. The patients were there in the city, urgently in need of treatment, many of them known to the health authorities, and the vast majority of them known to their local physicians, but because no one had come to them and worked with them, and finally persuaded them that they were in need of hospital or sanatorium treatment, they had remained in their homes, and had not only died there, but had given the disease to many others about them. I would, therefore, emphasize the need of finding out the size and extent of the tuberculosis problem in every community by means of a properly conducted survey; that nothing be taken for granted; and that discarding all facts and figures previously gathered, we get to work and really find out conditions as they are. Such surveys have a most wholesome effect. In terms of money they need not be expensive. The essentials are (1) a wise and tactful physician who knows how to conduct it properly; (2) a nurse or corps of nurses who can go into the homes of the people and make a house-to-house canvass; (3) some one who can tabulate and arrange the facts and figures obtained from such a survey and who can make proper deductions therefrom. The results obtained in terms of concrete and often startling and alarming facts and figures when given proper publicity will prove a most potent factor in developing public opinion to see the need of further efforts.

EDUCATIONAL METHODS: PUBLIC LECTURES ON TUBERCULOSIS.

Almost every association, great or small, maintains a lecture service of some kind. Whether or not a lecture is going to do good and really accomplish something depends not so much on the information imparted by the lecturer as his personality, and on what he does before and after his formal talk. I have lectured to almost every known kind of organization, and to tell the truth, I have reached the conclusion that I have accomplished remarkably little thereby as far as the lecture and the information I gave out were concerned. The good which has been accomplished by such lectures and gatherings of people has been by individual work with certain interested persons rather than by anything I said to the gathering as a whole. Therefore, I feel that lecture service, as such, except in special individual instances, where the man who gives the lecture has either a remarkable personality or an unusual ability to impart information and to impress facts upon his hearers, is not a very important part of antituberculosis work.

TUBERCULOSIS EXHIBITS.

We have all been to tuberculosis exhibits and have seen charts and statistics, good rooms and bad rooms, and photographs of all kinds, and most of us have left with our minds in a whirl and with very little definite or concrete information to help us, except that we wondered why we were not all dead. I do not think tuberculosis exhibits are of very great importance except in those communities where education, as far as health is concerned, is still in the very primary stage, and here, as in a lecture service, more depends on the person

who demonstrates the various features of the exhibit than on the exhibition itself. The exception I would make to this is in regard to children. Here, in our schools, public and private, there is a tremendous opportunity to give children facts concerning the fundamental rules in regard to health and hygiene that will leave an indelible impression. I would emphasize most strongly in this regard that the words "tuberculosis" and "consumption" be entirely left out, and that emphasis be put upon health and happiness and not upon disease and unhappiness.

MOVING PICTURES.

The moving picture theatres are now used to a certain extent as an educational means, but should be used much more. There is still an amazing lack of information in the minds of the people as well as in the minds of the medical profession in regard to public institutions, such as state, county and local sanatoria and hospitals for consumptives. In countless instances friends and relatives of patients, and even their physicians, have come to me finding fault with this or that in a certain institution, which they had never once visited or seen. Here, then, by means of moving pictures, is a field for very definite, practical and valuable work.

EDUCATION OF CHILDREN.

Some years ago a law was enacted in Massachusetts which required that tuberculosis and its prevention should be taught in those grades of our public schools in which the subjects of hygiene and physiology were taught. I was a firm believer in this law, for which I was criticized by an

older physician, who could see no possible reason why children should be taught anything about such a horrid and unpleasant subject as tuberculosis. I could not agree with him then, and I cannot agree with him now. I believe that this whole matter can be taught in a way that will teach valuable lessons and yet do no harm whatever. We must teach the children, just as we must teach the public as a whole, that the rules which govern tuberculosis are simply the rules of decent and right living. The Boy Scout and the Modern Health Crusade movements are efforts in this direction. More depends upon the tact, perseverance and skill of the individual teacher, be she one of the teaching staff or a nurse, than upon anything else. It is certainly one of the important duties of any tuberculosis association, therefore, to see to it that school children are given instruction in the rules of hygiene and right living, for it is with children that our educational efforts will have most effect. The Modern Health Crusade, which is now an important and the most popular piece of work being carried on by the National Tuberculosis Association, is a striking example of what can be done in this direction.

We have still a long way to go, however. School inspectors and physicians have been and are even now looking for disease rather than for specimens of perfect health. School teachers are too engrossed in instructing their charges in the mysteries of reading, writing and arithmetic to have much time or enthusiasm in teaching them the rules of health and hygiene. School hygiene associations, nutrition classes and clinics, school nurses, the Boy Scouts, and particularly the Modern Health Crusade, are movements that should have the hearty support of every one, and which should be backed and fostered by every tuberculosis association in the country.

THE PUBLIC PRESS.

One of the neglected fields of educational work is the public press. Here is a means which we have not used enough to reach all classes of people, and especially the medical profession and that group of men whose duty it is to frame and carry out our laws. I would suggest, therefore, that it become an important function of every tuberculosis society to maintain a press service, and to see that this work is done by some one who knows how to write newspaper English and who appreciates the importance of making such items of some news value as well as of educational value.

In every part of the country newspapers are giving an increasing amount of space to matters pertaining to the conservation or betterment of health. They constitute one of the most important educational forces in the country and it is most important for health officers and others whose work includes health education to avail themselves of this force in the interests of public health.

In making use of newspapers for the dissemination of information in regard to public health or the prevention of disease, there are certain points to be borne in mind. The fundamentals of a newspaper story are (1) that it must be news; (2) that it be attractively told, and (3) that it be brief. For a newspaper, the article should take the popular viewpoint and not the scientific one. No matter how valuable the information, its use may be easily spoiled for the press if phrased in too scientific English. Remember that it is the reporter's business to get the story he is after. If you decline to give him the facts as they are, he is very liable to get a distorted version from someone else. Therefore, when the newspaper sends its representatives to you

for information give him the information he asks for and give it to him briefly and in simple language.

Whatever you may wish to present to the newspapers should have "news value." The public, upon which the newspaper depends for its support, demands news, and chafes at the presentation of old stories no matter how useful or beneficial they may be. Therefore bright, newsy items are most likely to be used. Short, meaty stories of your work embodying items of novelty are what the newspapers like to have. The preparation of such notes is not the job for an office boy, but is worthy of skilled attention.

Prepare your statements in typewriting, and in manifold if you can so as to furnish them to all the newspapers of your district. When once you have shown the city editor that there is material in your office ready to his hand, he will be your constant visitor and when you have convinced him that your office is a clearing house of reliable information concerning your particular subject, he will be your friend and helper.

EDUCATION OF LEGISLATORS.

In the United States comparatively slight efforts are made by the medical profession to control or influence medical legislation in the state legislatures. The little that is done in this direction is too often delayed until this or that bill has reached a stage when it is given a hearing, and by this time, unfortunately, there is very little chance of accomplishing much. After ten years' fairly close observation of this subject, I have come to the conclusion that it is ignorance, not wilful or vicious, but simply plain ignorance on the part of our legislators which leads to so many errors of omission and commission in health matters. They do not know why this or that appropriation should be made. They

cannot see the harm that this or that bill is going to do, perhaps not in the present but in the future, and therefore they do not favor the one or oppose the other. The best time to reach the legislator is before his election; the next best time is immediately after his election; and finally, there must be some method whereby he can be approached not by one or two interested individuals, but by many such. Every association, if it has not done so already, should develop the machinery whereby legislators can be approached either by letter, or better, in person, by hundreds of physicians and prominent men and women, so that they will see that what is asked is not merely the individual whim or fancy of one or two, but the firm and decided opinion of many from all races and walks of life.

THE SANATORIUM.

During recent years various articles have appeared asking the question as to whether or not the sanatorium is worth while or has outlived its usefulness. We have each of us at some time or other pondered over this. How often have you or I, when we have seen a patient discharged from a sanatorium apparently well and strong, in six months' time relapse into a condition worse than he was before, asked ourselves the question—"What is wrong with the sanatorium and its treatment, and why are not its results more permanent?" The sanatorium *is* worth while. This can be maintained beyond the shadow of a doubt, but the sanatorium must be made to symbolize something more than a splendid group of buildings beautifully located and surrounded by the best that Nature can give, where there is good food and careful medical supervision. It must mean more than this. The word "sanatorium," coming from the active verb,

“sanare”—to heal—must mean that the patient is kept under supervision not merely while he is within its walls, but for months after his discharge. This is what modern sanatorium treatment must mean, and until it does mean this, our results will be poor. A proper system of after-care work, following up the patient after his discharge, must be looked upon as a necessary and integral part of every sanatorium. It should begin in the sanatorium itself, and should be carried on after the patient has left. The patient who is about to leave, or who shows signs of becoming restive, should be approached by some nurse or social worker, who, kindly, tactfully, yet firmly, will either try to persuade him to remain as long as he should, or else pave the way for his future career, and who, after the patient has left the institution, will visit his family, inspect his home, get in touch with his physician and his employer, and see that he continues the methods of treatment which have helped to bring back his health. This is real sanatorium treatment.

CONSULTATION SERVICE.

Up to the present time the superintendents and physicians of state, county and municipal sanatoria and hospitals for consumptives, as well as the doctors directing the work of tuberculosis dispensaries, have limited their attention to the patients in their institution or those who came to them. There are, of course, many patients in need of expert medical advice who, for reasons of sickness, distance, or lack of funds, are unable to obtain the service of such physicians skilled in the diagnosis and treatment of tuberculosis. The establishment of consultation service is an endeavor to remedy this defect in our system. This has recently been done in Massachusetts. With the help of the Massachusetts Tuber-

culosis League, it was arranged that the superintendent of one of the county sanatoria should devote half of his time to the examination of patients in the cities, towns and villages of his district. A definite schedule was arranged so that it was known beforehand that on a certain date this doctor would be at a certain place. Here the local physicians and nurses assembled patients concerning whose diagnosis and treatment there was doubt, so that they could be seen and examined by this physician. Arrangements were made for payment of a moderate fee by those who could afford to do so, so that there was no question as to any abuse of medical charity.

So far, this plan has proved eminently successful. The physicians feel that they have here a man in no way in competition with them, who can help them out in difficult cases among the poorer class of patients who cannot afford to pay a large consultant fee, while for the sanatorium superintendent himself, it offers a chance to see other conditions besides tuberculosis, and to widen to a great degree the sphere of his usefulness. This arrangement has now been extended in Massachusetts into a statewide scheme, whereby the state is divided into districts, each district to be covered by a consultation service as described above. This, especially in scattered agricultural districts, has already proved of great value. I believe that in the future it will be one of the duties of every well-equipped sanatorium to maintain not only an out-patient department, but a consultation service along the lines here described.

TUBERCULOSIS DISPENSARIES.

Look up in the Century Dictionary or in any encyclopedia, and you will find that the word "dispensary" is briefly

defined as a place to which sick people may go and receive treatment. This must not be our definition. Just as a sanatorium without a nurse or a social worker to carry on after-care work is not a sanatorium in the proper sense of the word, so a dispensary cannot be called a real dispensary as far as tuberculosis is concerned unless it is equipped with a nurse or a corps of nurses, depending upon its size, who will visit the home of the individual patient, advise and counsel the family as well as the patient, and who will instruct the patient in the details of what he must do. There are other essentials in addition to this that go to make up the proper dispensary. Its location must be accessible to those whom it is intended to serve. It should not be in an isolated district, where it can be reached only by either a long walk or trolley ride. Its rooms should be cheerful, sunny and bright. There should be a special day for children, and of particular importance, except in small communities, it should be open one or two evenings a week, so that a man or woman need not give up an entire day or even half a day in order to get medical advice. If possible, the physicians conducting the examination should be men specially trained in their work, but, above all, these physicians must have tact and common sense. I would rather have a level-headed general practitioner, who is endowed with common sense, in charge of my dispensary than the most skilled and scientific trained sanatorium physician in the world that did not have that valuable attribute.

NON-PULMONARY TUBERCULOSIS.

Hitherto, our efforts have been devoted almost entirely to tuberculosis of the lungs. We have had to do this because it is this form of the disease which is dangerous to others. In the vast majority of cases, tuberculosis of glands, bones

or joints, while dangerous and distressing to the individual patient, does no harm to those about him. The time is soon coming when we should take the next step in advance and give those patients who are so fortunate—or I should rather call it unfortunate—as to have the disease outside of their lungs, the same chance of getting well as do those who have pulmonary tuberculosis. It is a curious and unfortunate state of affairs that the patient with pulmonary tuberculosis who comes into a dispensary, and especially one who is lucky enough to have a hemorrhage in the presence of the doctor, is immediately diagnosed as a consumptive, and if possible sent to a sanatorium or given the fresh air and proper hygiene of which he is in need, while the man, woman or child who has glands in the neck, or tuberculous disease in the kidney or elsewhere, is looked upon as a proper subject for surgical skill or, too often, the lack of it. Treatment in his case is often devoted to that small part of his body which is diseased, while the individual himself who owns the disease is neglected. We have reached a stage when this should be changed. We must spread the news that tuberculosis is the same no matter in what part of the body it is located, and that the same sunshine, fresh air and proper food that cure the consumptive will likewise help to cure the child with Pott's disease or the man or woman with enlarged glands in the neck.

TUBERCULOSIS LEGISLATION.

Do we need more laws in regard to tuberculosis? I believe not. Although tuberculosis is a reportable disease, a large proportion of cases still go unreported. More laws will not help this state of affairs, nor is it due entirely to laxness on the part of the medical profession. Tactless and misdirected activity of local health boards have often done harm to many

patients and have, as well, prejudiced their physicians strongly against reporting future cases. Education as to the need of reporting tuberculosis on the one hand, and tact on the part of local authorities on the other, are what will solve the problem.

How much do antispitting laws accomplish? Very little, I fear. Here again education as to habits of cleanliness and decent living, and not more legislation is what is needed.

What we have accomplished in reducing the mortality from consumption during the past twenty-five years and what we will accomplish in the future is *not* because by means of sanatoria we have cured a number of patients, nor because we have prevented the spread of infection by providing beds for advanced consumptives, but because we have spread the gospel of right living. It is what we are doing to solve the tenement and housing problem; it is school and factory inspection and hygiene; prevention of industrial diseases; it is a pure milk and water supply, thereby eliminating typhoid and other acute infectious disease; open-air schools, Boy Scouts, Health Crusaders—it is all this, and not our efforts directed solely at the tubercle bacillus or the tuberculous individual that is ridding the world of tuberculosis.

Therefore, let us broaden our vision; let us assume an aggressive attitude toward our problem; let us know what our problem is as to every minutest detail, but let us attack it from the broadest angle.



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